BRITISH MEDICAL JOURNAL

LONDON SATURDAY OCTOBER 22 1938

THE STATE AND MEDICAL RESEARCH*

BY

SIR EDWARD MELLANBY, K.C.B., M.D., F.R.C.P., F.R.S.

Secretary, Medical Research Council

At no time has the position been more favourable than to-day for appreciating Harvey's greatness as an investigator or for acknowledging the extraordinary position he holds as a leader of medical science. More and more men are endeavouring to follow his example, and the revolutionary changes in medicine during the past sixty years have only increased the appreciation of his foresight and skill.

Many still living have seen this revolutionary phase of modern medicine and surgery in its entirety—the introduction of new methods of prevention, diagnosis, and treatment of disease, the enormous increase in hospital accommodation, the initiation and development of clinical laboratories and radiological departments, and the transformation and multiplication of the public health services. Most medical men will agree that the main cause of these developments is the great increase of knowledge in medical science acquired in the past sixty or seventy years as the result of investigation. People began to realize that health and disease are not conditions conferred upon man for humble acceptance, but that a certain method (Harvey's method) of acquiring knowledge is at hand, and that by this knowledge disease can be combated and death itself warded off. More men and women entered the field of investigation, and knowledge accumulated more rapidly. Success bred success. A spirit of optimism as regards the acquisition of good health and the elimination of ill-health pervaded the mind of civilized man.

It cannot be denied that in this country, and even more so in the United States of America, the increase in scientific research has had no special intellectual basis so far as the public, even the enlightened public, is concerned. Research has been found to deliver the goods in these countries often enough to deserve special encouragement. This was not the case in Germany, where for a hundred years or more it had been accepted that teaching in medicine should be done by those who could extend or had extended the boundaries of knowledge by research. It is true that great medical discoveries were made in the past century in countries other than Germany, but in such cases the researches which led to these discoveries were made by men of genius working independently and often under uncongenial conditions. Germany, on the other hand, had an academic atmosphere saturated with the research spirit. Whatever may be the present or future state of medical and other science in Germany, we ought to remember with appreciation this enlightened attitude, which flourished at a time when medical research breathed but feebly in other countries. Nor, in these earlier times, was the outlook utilitarian. A time came, however, when it was apparent that medical research could and did forge weapons to fight disease. The discovery of antiseptics, antitoxins, and salvarsan left no doubt on this point. It came to be realized that medical and other research was not an interest of a few curious people with a special aptitude for discovering facts which seemed to have but little bearing on life. Wise men, both in public life and in industry, saw that scientific research was the life-blood of modern existence, that it was a means of providing easily the needs of mankind and the knowledge necessary for healthy existence under modern conditions. As might be expected, the earlier disinterested German attitude was first affected by the practical issues, and organized research there received even a greater fillip. Industrial leaders in Germany and in the United States of America also soon grasped the significance of research applied to industry, and found that throwing a sprat of expenditure on research to catch a mackerel of large profit was good business.

It has sometimes been said that it took the great war to make this country realize the importance of scientific research, and it is true that the Department of Scientific and Industrial Research was only set up in 1915, largely as the result of the urgent demands of war. The Medical Research Committee, however, was initiated in 1913. Practically all its activities until 1919 were directed to the solution of medical problems related to war, and right well did it justify itself.

The Endowment of Research

During the present century there have been two rapid developments in medical research activity running side by side, the one in this country and the other in the United States: the former organized and to a large extent financed by the State, the latter richly endowed and controlled by private interests. Each movement has already produced a good harvest, but the crops differ in many respects. It can at least be said that the American record of medical research during the past twenty years has been a very fine one. There is good reason to believe that in America the State intends in the near future greatly to supplement private endowment for medical research, and the recent

* Harveian Oration (abridged) given to the Royal College of Physicians of London, October 18, 1938.

Nuffield scheme started at Oxford is possibly an indication that private individuals here will in future regard the endowment of such research as more worthy of support than in the past.

Financial aid, either from the State or from private endowment, is an essential to research. Money cannot, of course, buy discoveries, certainly not great discoveries, in the same way as it can buy manual labour; but it can offer freedom from the need for earning a living by ordinary work, and afford to those with the necessary ability the means to devote their lives to research. Until recent times, scientific discovery in this country has depended only too often on the haphazard distribution of wealth. Sometimes, as in the case of Darwin, private means have allowed leisure for experiment and contemplation. Sometimes a private society, such as the Royal Institution, has endowed men like Humphry Davy and Faraday in the same way as Trinity College, Cambridge, subsidized Newton. If these men had been completely without financial resources, and dependent for their living on ordinary labour, there can be no reasonable doubt that the particular discoveries associated with their names would not have been made by them.

On the other hand, the limitations of finance to ensure additions to knowledge are equally undoubted. Some of the best work has been done by men labouring under conditions of extreme simplicity. Would, for instance, the work of Claude Bernard and Pasteur have been better had they received abundant financial support early in their lives? It is true that when their work was more or less finished both these men were given adequate laboratory facilities, but for most of their active lives, when they were making their great discoveries, they worked under very poor conditions. The Harveys, the Claude Bernards, and the Pasteurs of this world will make discoveries under the most meagre circumstances, and, beyond a minimum of amenities, increased finance and improved facilities may not aid their output—may, indeed, detract from it.

These instances from past history, where men given slight but real opportunity have made discoveries of the first order, have imbued us all with the thought that many a genius for research must have been lost to the world by lack of such opportunity, and there is a determination that in future finance will not be the preventing factor. Nothing is more clear than that the mental outlook and ability to discover are present throughout all grades of society. Whether this ability is equally distributed is not so sure. In any case, the real discoverer is a rarity in all classes of society, and it must be the object of civilized communities to find these individuals and give them the means of freely carrying out their activities. As a class, those who choose research for their life's work are unworldly in the sense that they are content with a relatively low standard of living as compared with what they could often obtain in other walks of life. It is generally true that the more able the investigator the less are his demands on life's amenities. Even so, however, there is a limit to this, and the scientific genius when found must be given his chance and not be expected to use up all his time and energy fending for a living. In addition to these men there are a larger number who, although not men of genius, work out the rich veins discovered by their leaders. These men must also be looked after and given facilities for their work.

This, then, was the great justification in this country for State support for research, since private endowment was completely inadequate. Everybody will be agreed up to this point. In the absence of private endowment State support assures the opportunity and offers a means of livelihood to potential investigators who could not otherwise direct their activities to medical research. On the other hand, it is certain that State endowment of medical research must be associated with State control. According to general experience, such control is often repressive and is accompanied by bureaucratic methods and all that these imply. The words "control" and "bureaucracy" have a disagreeable sound in all ears, but more particularly in the ears of those searching after truth by experiment, when success depends upon freedom to work quietly. One of the main objects of this discourse is to show how State control of medical research can be brought about and be compatible with freedom to the investigator. Another object is to explain the manner in which State funds are used for the purpose of promoting discovery in medicine.

The Medical Research Council

It is now twenty-five years since the Government decided to promote medical research by setting up the Medical Research Committee under the National Health Insurance Joint Commission to administer funds provided by the National Health Insurance Act of 1911. This arrangement was terminated in 1920 when the Medical Research Council received its present title and constitution. From this time funds for its work began to be provided direct from the Treasury in the form of a Parliamentary grant-in-aid, and the Council became subject to the general direction of the new Committee of Privy Council for Medical Research, with the Lord President of the Council as Chairman.

Of the present eleven members of the Council, eight are men chosen for their scientific and medical qualifications in the various fields of medical science. Every scientific member must not only have the approval before election of the Lord President of the Council but also that of the President of the Royal Society. Only two members are politicians in the sense that one must be a representative of the House of Lords and the other of the House of Commons. At present the remaining member, the treasurer, is a distinguished banker. With a body of this nature it will be seen that direct political influence is not likely to affect their decisions. It might then be said that, although direct political influence is obviated by the constitution of the Council, some such influence might still be exerted through the secretariat and permanent officials. To meet this the Secretary of the Council is elected by the Council itself—that is, by the scientific majority of the members. The Secretary of the Council is also Secretary of the Committee of Privy Council for Medical Research. There are, in other words, no administrative officials or machinery standing between the Medical Research Council and the Lord President of the Council. So far as constitution and powers are concerned, every action has been taken to see that the Council consists mainly of a group of experts in medical research with full authority to use and control the public money placed at its disposal, independently of all other bodies.

A question that oftens arises calls for consideration here. Some will doubt whether it is good for medical science that any group of men, such as constitute the Medical Research Council, should be in a position to act almost as dictators in a whole branch of scientific study. It may be argued that, however able, they are apt to become for the time being a body of official interpreters of the truth and, if they are wrong, to misdirect the lines of investigation and

even the interpretation of results so as to interfere with the development of truth. The first answer is that a sure safeguard against the continuation of biased views by an authoritative body is the constant change of personnel of the Council, whose individual term of office is four years. It is, however, a most important question, and its importance is made particularly evident when medical men occasionally appeal to the Council, not for financial support so much as for moral backing of their particular views and a pontifical declaration in favour of their special solutions of problems of health and disease. It is obvious that the Council must never become a backer of any speculative views. In forwarding research the Council must clearly use its discretion, and it can only act to the best of its judgment in this most difficult enterprise.

For the most part, good work is financially supported, but occasionally other work of a more uncertain nature is given the benefit of the doubt and assisted until its true value is seen; but whether the work be good or otherwise, the results obtained, and the views expressed thereon, are those of the individual investigators and not of the Council.

There always have been, and there probably always will be, mistakes in the appraisement of some investigators and their work—cases where relatively poor workers stand, especially in the eyes of their near colleagues, on a pedestal of distinction, and the much more serious case where the first-class discoverer and his work go unrecognized. After all, it is not so long since Lister passed through ten years of criticism and obloquy before the value of antisepsis was accepted. The Medical Research Council can do something to prevent the recurrence of an incident of this kind by asking other workers to repeat the investigation which is criticized; but that is not enough, and it is necessary for all medical men, especially those not engaged in research, to be guarded in their criticisms of the discoveries of others. The critical mind is useful, however, especially when it is associated with the power of discovery. A long experience of scientific research has taught me that only seldom are the facts of a discovery wrong; but the interpretation of these facts, and especially the first interpretation, is often wrong.

This question of the appraisal of new discoveries, especially when they are of a nature which requires much time and careful inquiry for repetition, is clearly one of great difficulty. Nor, so far as the individual worker is concerned, does the matter end always with the establishment of the correctness of the discovery itself, especially if it is one of great importance, and even Harvey's reputation as a clinician was anything but raised by his discovery of the circulation of the blood. Wrong personal judgments and false values are always liable to be met with in the research field, and this is one of the strains which individual workers must expect to experience. At least it will be clear that the estimation of the relative value of discoverers and their discoveries is one of great importance to the Medical Research Council, all of whose actions in promoting research are a reflection of its judgment of men and their investigations. In my experience more mistakes of judgment are due to benevolence than to harshness, so far as the Medical Research Council is concerned.

Advisory Committees

A brief description of the mechanism and some of the general principles guiding the actions of the Medical Research Council may now be given, because there are probably many medical men interested in research who have no idea of these facts.

For general guidance, as regards much of the detailed work, the Council relies on the advice of committees specially set up to cover a large part of the field of medical science. Here, as in the formation of the Council itself, and indeed as in every problem of medical research, the question of personnel holds the key to the situation. Every person should be chosen primarily because of his capacity to aid investigation. Representation either of territory or of learned societies must be absolutely subsidiary to the main purpose of research itself. Territorial and representative interests are out of place in these committees; detailed technical knowledge and sound judgment alone are essential. Representation on committees must, if possible, be confined to representation of research in different parts of the special field of investigation, and it is always wise to have a number of active workers as well as those with past experience of research in any body whose duty it is to plan, initiate, and guide investigation into unknown territory.

The Medical Research Council has twenty-seven such committees. In addition, the Industrial Health Research Board, an important subsidiary of the Medical Research Council, receives advice and guidance from those committees whose work is primarily associated with problems of industry. Some of these committees are appointed conjointly with other bodies. All the services of the members of committees are given voluntarily, and magnificent work has been done by them. Their advice and help are absolutely essential for the work of the Medical Research Council.

Finance

Now a few words as to the finance of the Medical Research Council. Its present annual grant from the State is £195,000, having increased to this sum from about £50,000 which it received at the time of its institution as the Medical Research Committee twenty-five years ago. The block grant is considered every five years, a method which has its advantages and disadvantages. It has the advantage of allowing the Council to plan ahead with some feeling of security. It has the disadvantage of having to provide suddenly for expensive research, often at the request of other Government departments, out of a fixed income, and so curtailing the ordinary programme. It tends to lead to periods of expansion followed by periods of penury. The present time is one of penury. One year of penury in five is probably good, as it gives an opportunity for reviewing research programmes more closely and cutting out any dead wood that tends to occur. In addition to its public funds, the Council is in a position to help in the disposal of private endowments for medical research, and to do this either by directly controlling such funds or by giving advice to others who themselves hold the money. Private funds held by the Council for disposal as interest or capital amount to over £100,000, and, in addition, it receives annual sums of money for special purposes from the Rockefeller Foundation, the Dental Board, the Leverhulme Trustees, the British Empire Cancer Campaign, and the Halley Stewart Trustees amounting to £12,000. Altogether the sum at the disposal of the Council at the present time amounts to about £220,000 per annum.

There has recently been some public criticism, both in the Press and in Parliament, about the small amount of financial support provided by the State for medical research. It has been said that it is a curious anomaly that only £195,000 per annum is provided by the Government for research on disease which costs the country from 200 to 300 million pounds annually, since it is mainly by

research that the Government can hope to reduce the vast amount of sickness and the expenditure it involves. Whereas it is undoubted that much more financial provision is required for medical research, there is no reasonable doubt that in course of time this money will be forthcoming. The Treasury naturally demands that every request for an increase in research expenditure must be justified.

There are three main directions in which the Council disposes of the money. In the first place, the National Institute for Medical Research at Hampstead and Mill Hill has been established. Secondly, a rapidly growing number of research units, both clinical and laboratory, and whole-time workers at various centres in London and elsewhere are maintained. In the third place, grants are given to individual workers for specific pieces of research at many of the universities and hospitals throughout the country.

The National Institute for Medical Research

This organization was set up with the idea of doing large-scale and long-distance work requiring investigation by teams, and of a nature not suitable for university or hospital laboratories. Here, under the direction of Sir Henry Dale, the work is done in two main divisions: physiology, pharmacology, and biochemistry on the one hand, and experimental pathology and bacteriology on the other. An active subdivision of the former is endocrinology; while subdivisions of the latter include protistology and microscopy and physical methods. In addition to the above there is a Department of Biological Standards, the personnel of which is small, since every member of the staff of the National Institute is expected to contribute to this important part of the work when his special knowledge of a particular problem is regarded as essential.

The work of the National Institute has always reached the highest standard, and to recall its many triumphs would be a pleasant task, but it may be well to dwell on one aspect of it only—of particular interest to the practising doctor—which it has taken in its stride. I refer to the biological standardization of drugs.

Standardization of Biological Substances

Here it can be claimed without cavil that the National Institute has led the world and, both nationally and internationally, has rendered a great practical service to mankind. Here have been devised, are held, and are distributed standards required by the British Government for the purpose of the Therapeutic Substances Act, others for the Health Organization of the League of Nations, and some made necessary by the inclusion in the *British Pharmacopoeia* of biological assays for certain remedies. The following standards are held at the National Institute:

Antitoxins and Antisera: Tetanus antitoxin; diphtheria antitoxin; gas-gangrene antitoxin—(*a*) *perfringens*, (*b*) *Vibrion septique*. (*c*) *oedematiens*; staphylococcus antitoxin; anti-dysentery serum (Shiga); anti-pneumococcus serum, Types I and II. *Drugs:* Digitalis, ouabain, strophanthin, arsphenamine, neoarsphenamine, and sulpharsphenamine. *Vitamins:* Vitamins A, B, C, and D. *Hormones:* Insulin; pituitary (posterior lobe); oestrus-producing hormones—(*a*) hydroxyketonic form (oestrone), (*b*) benzoate form (oestradiol monobenzoate); male sex hormone (androsterone); corpus luteum hormone (progesterone).

Recently additional standards have been adopted by the Health Section of the League of Nations for four of the active principles of the anterior pituitary gland, and these will be prepared and stored at the National Institute.

In addition, the Medical Research Council maintains at the Lister Institute the National Collection of Type Cultures of Micro-organisms, so that, at any time, any doctor in the world can obtain for a nominal sum a specimen culture of almost any type of micro-organism. The value of this service is shown by the fact that 5,000 such applications were made last year. In a similar way medical men and research workers can obtain standard bacterial suspensions and sera for the diagnosis of enteric, dysenteric, brucella, and meningococcal infections from the Standards Department maintained at the pathological laboratory of Oxford University by the Medical Research Council. It will be obvious to anybody interested in the subject of biological standards that this work necessitates continuous research in the maintenance of standards, in the search for new standards, and in helping towards a solution the innumerable problems which arise during their use.

Research Units and External Staff Workers

The second line of policy is the placing of units of research in different institutions. This plan has shown great developments in recent years, and its progress is limited only by finance and personnel—that is to say, the Council is desirous of promoting further development along these lines, as it considers this is one of the most effective methods of aiding research. When such a unit is set up in any place the Council makes itself responsible for the payment of salaries and the actual cost of the research. It expects the university or hospital, however, to provide accommodation and ordinary services, and in the case of hospitals the provision of beds and nursing facilities. To ensure the success of each unit the most crucial point is the choice of a suitable director, who becomes a member of the Council's whole-time staff. Every encouragement is given by the Council to ensure that the unit is regarded with pride by its hosts, and each unit is considered to form an integral part of the hospital or university where it is placed. The following units have been established by the Council:

(1) The department of clinical research at University College Hospital; (2) the neurological research unit at the National Hospital for Diseases of the Nervous System; (3) the department of research in puerperal infections at Queen Charlotte's Hospital (with the aid of (*a*) the Rockefeller Foundation and (*b*) the Pilgrim Trust); (4) the department of bacterial chemistry at the Bland-Sutton Institute of Pathology and Courtauld Institute of Biochemistry, Middlesex Hospital, with the help of the Leverhulme and Halley-Stewart Trustees; (5) nutritional units (*a*) at the Lister Institute and (*b*) at the Dunn Nutritional Laboratories, Cambridge; (6) a unit of clinical research at Guy's Hospital; (7) a unit of research on mental defect at the Royal Eastern Counties Institution, Colchester; (8) a unit of research in experimental and clinical surgery at Edinburgh University and the Royal Infirmary, Edinburgh; (9) a department of statistics at the London School of Hygiene and Tropical Medicine; (10) a unit of industrial psychology at Cambridge University. Other members of the staff of the Medical Research Council are seeded in other universities and hospitals, each an expert in his own line and acting as a central stimulus to those around.

The influence of this policy on medical research in individual universities, hospitals, and medical schools is great. In some cases the appointments have been too recent to reach their maximum effectiveness, but in some of the older-established units the work has been first-class and is known throughout the world. There are still many important gaps in this programme, and the expansion of the policy will undoubtedly continue.

Research Grants

Now as regards the third part of the Council's policy—the giving of personal and expenses grants to aid research by individuals. The personal grants are temporary, and are usually limited to three years. This rule is, however, not always applied, and, so far as the Council can help, it is not allowed to end promising and successful research. In making these grants the initiative nearly always rests with the head of a laboratory or hospital in favour of some individual worker, or with the worker himself. The success of the application depends upon the individual and his choice of subject, and the kind of help, when given, varies greatly. Sometimes personal grants for whole-time or part-time work are made; sometimes money is provided for research expenses; and occasionally, in the case of more established workers, for technical assistance. It is in this part of the Council's activities that the various committees are most helpful.

It is difficult to appraise the real value of this policy. It is the side of the Council's work of which most is heard, for every grantee is expected to refer in his publications to help he has received from the Council. A review of scientific and clinical journals soon reveals, therefore, the number and nature of these grants, and it is commonly found in many particular journals that a large part of the work published has been financed from this source. On the other hand, there is undoubtedly some wastage, which is probably not surprising, since at any time about three hundred separate investigations are being thus supported.

One point ought to be realized by those interested in applications for research grants. The Council provides money to individuals and not to institutions. The reason for this is obvious, because the Council considers it essential to control the choice of the individual worker and the type of investigation. Much trouble and much criticism of the Council's activities have arisen through non-appreciation of this rule. When, therefore, institutions, such as universities or hospitals, are planning a scheme of medical research which they cannot completely finance it is desirable, if they wish for financial support, that they should consult the Council in the early stages and before the personnel are appointed. Needless to say, its advice is entirely disinterested, and help in such cases is gladly given.

After a personal or expenses grant is once made every individual is given the fullest freedom to develop his problem. He is encouraged to keep in touch with other investigators studying allied subjects, and it is the duty of the secretary to help in every way. Apart from sending in a short statement each year to be grafted into the annual report of the Council, and the return of vouchers for expenses, the grantee has absolute freedom, and his work is generally allowed to continue for three years unless for some special reason. By this time the average worker has had his chance, and, if at all successful, he qualifies either for a further grant or for one of the many fellowships established in the country, or is definitely placed in a post allowing research facilities. By this means also many young clinicians are given an opportunity both for research and to establish themselves. This interest of the Council in providing personal and expenses grants must not be viewed too narrowly in terms of discovery, but its influence as a recruiting field and as an educative process must also be taken into account.

There is one other activity of the Medical Research Council which touches this College closely and about which it is desirable to speak. I refer to its policy of awarding travelling fellowships in research. The greater number of these are generously financed by the Rockefeller Foundation of New York, and others are paid out of the Council's private endowments. In all cases the award is at the full discretion of the Council, and each year many applications for these fellowships are received from young medical men with excellent medical and scientific records. A large number of the prominent young medical men in this country—both in clinical and in laboratory work—will be found among the past holders of travelling research fellowships.

Research for Government Departments

This part of the work is rapidly growing, and only its great importance justifies the large expenditure of the Council's resources on these investigations. Questions of health and disease in all their aspects are assuming greater prominence in the view of Government departments, and since many of these problems demand investigation and expert advice the Medical Research Council is often called upon for assistance.

It is useless to deny that the attitude of the Council towards the problems presented varies greatly, and all are not greeted with enthusiasm. Most of them require from the investigators answers which offer a practical solution of difficulties. If an effective answer to any problem can be foreseen the probability is that the work required is more of a routine nature and for that reason itself the inquiry may be unattractive. If the problem is more difficult and no immediate solution can be foreseen, the fact that an early answer is expected may make the task irksome to the investigator.

On the other hand, some of the problems raised by Government departments are greatly welcomed by the Medical Research Council because they offer entry into fields of opportunity where a rich harvest can certainly be obtained. One of these, in which the Council has gladly taken on large responsibility, is that of tropical medical research at the request of the Colonial Office. Already it has sent a number of trained workers into different parts of the tropical Empire to study various problems, and the opportunities are so great that it has also embarked on a scheme for training young men in research in tropical diseases. Quite recently it has also appointed a small number of experts to direct and co-ordinate a large nutritional survey in many colonial territories.

It is impossible, however, to deal adequately here with this aspect of the Council's work, but it can be assumed that most Government departments call on the Council for help and advice, and such calls often involve large-scale research. This phase of activity is removed from the public eye, but its value is none the less very great, and promises to be even greater in the future.

Research Supported by the Council

A few words now on the actual research supported by the Council. On the whole, although there are many exceptions, it will be seen that the Council's initiative in research is largely confined to the work of its permanent staff, while as regards grants (personal and expenses) the initiative lies with the investigators. This is a crude way of expressing the situation, because the permanent staff themselves have wide liberty of action in planning their investigations, and the initiative of the Council is only apparent

in the choice of the personnel, which depends on the merits of each member and on the subject he represents.

The Council seldom chooses particular diseases for investigation, though here again there are exceptions, and any promising line is followed up as a special problem when it offers itself. Generally the choice is of a broader nature, so as to include a group of diseases or a type of treatment of wide application or a system of physiological control. For instance, in the early days of the National Institute for Medical Research the Council decided to encourage specially the study of virus disease. A staff of workers was appointed, with Sir Patrick Laidlaw as leader. More recently the Council decided to extend its interests in endocrinology, and appointed Dr. Parkes to lead this work. Other able investigators were chosen as the undertaking developed, and now there is an energetic team at the National Institute investigating endocrinological problems from all angles and also working in close harmony with most of those engaged in research on this subject, both from a laboratory and a clinical aspect, throughout the country. The most recent decision of the Medical Research Council to develop the field of chemotherapy on a much larger scale than anything previously seen here is now well known. The reasons for this decision have received wide publicity, and I shall not discuss the matter further.

These, then, are some examples of the kind of initiative in research shown by the Council. In a sense, however, all its appointments to the permanent staff, whether at Hampstead or in different parts of the country, are examples of initiation of specific research. Posts have been made for suitable men in the subject to be stimulated, and not men appointed to established posts.

Nothing has yet been said specifically about the desire to encourage clinical research by the setting up of clinical units. It is well known that this is one of the main objects of the Council. This programme is being slowly but steadily developed. As men suitable for appointment to posts of this nature appear, more units will be set up. If clinical research is to enter into its kingdom, success in its early enterprises must be obtained, and this can only happen if first-class investigators are appointed to these posts.

It will thus be seen how it comes about that the Medical Research Council has not usually adopted the practice of making an organized attack on special diseases except when the problem has developed as part of a larger and more general investigation. It has not, for instance, made a mass attack on such important diseases as rheumatism in its many forms and cancer, although, of course, in both instances it supports a good deal of research by different individuals. It considers that it would be relatively unprofitable to spend the large part of its total resources necessary for the adequate study of these diseases at the expense of other work. Extensive *ad hoc* research on a disease like rheumatism, however important as a practical problem, is apt to be unprofitable until the master key of its aetiology or some other essential fact has been disclosed. This master key is just as likely to be discovered by the use of the experimental method over a wide field as by the direct study of a particular disease where the experimental method is hardly available at present. Much is heard about the value of team work nowadays, and far be it from me to decry this method of investigation. But the success of team work depends either on brilliant leadership or on the working out of a special line of inquiry, and this latter is usually supplied by the observation of one individual. There is no great difficulty in arranging team work; the difficulty is to find the outstanding individual discoverer—the Harvey—to blaze the trail.

Criticism is often made of the type of medical research supported by the Medical Research Council. Sometimes it is said that this work is generally too academic and includes too many problems of biochemistry, biophysics, and physiology. These critics take the view that much more money should be devoted to clinical research and direct attack on disease. The opposing school say that more money ought to be used for the support of fundamental research and that all major discoveries in medicine come from disinterested research in fundamental medical science. The fact is, however, there is no royal road to discovery in medicine, and all we know is that the experimental method used by Harvey with such brilliant results is still the sure method for acquiring knowledge and "searching out Nature."

The Physiological Aspect of Disease

Claude Bernard took the view that all experimental medicine was applied physiology—a view which was killed at the time and for many years after by the success of the investigations of his fellow-countryman Pasteur, of Koch, and of the army of bacteriologists who followed them. When all disease came to be regarded as due to the invasion of the body by some form of *materies morbi*, the body itself was either forgotten completely or attention was mainly confined to the blood and its immunological powers. In more recent times the Claude Bernard point of view has received wider acceptance. The sooner the investigator recognizes the truth of both the physiological and the invasive bases of disease and the close interaction of these factors, the quicker will be the advance of medicine. Defence of the body against invasion by pathogenic micro-organisms represents a physiological process, and there ought to be no dividing-line between the two aspects of the subject for the wise investigator.

My predecessor, the late Sir Walter Fletcher, whose wisdom in guiding the policy and action of the Medical Research Council for the first nineteen years was exceptionally great, was strongly imbued with the Claude Bernard point of view, and played no small part in encouraging the revival of this philosophic outlook on medical research. It requires wise interpretation and tends to mislead those of narrow orthodox outlook who think of physiology in terms of the textbook. Yet there is nothing more prominently established in modern times than the success in discovery which has followed the extension of interest by the physiologist into that aspect of a problem which concerns a function going wrong—that is, its pathology. Again and again we have seen points of major physiological interest established by work on the pathological side. What would we know at present about such things as vitamins B_1, C, and D, insulin, thyroxine, cortin, liver and stomach active principles of pernicious anaemia, if experimental research had not been directed to the abnormal? Yet all these are physiological substances of the first order. Who can doubt that the physiology of the eye would be greatly extended by a knowledge of glaucoma, of the blood vessels by a knowledge of the cause or causes of hyperpiesis, of the heart by a knowledge of the causes of auricular fibrillation, of the kidneys by a knowledge of albuminuria, of the alimentary tract by a knowledge of gastric and duodenal ulcer, appendicitis, and colitis? It is probably no exaggeration to say that it is no more unlikely that a

physiological truth will come out of an experimental study of a pathological condition than that a fact of pathological significance will result from a purely physiological study. Every man working on a problem from either angle ought to be familiar with the other aspect. There has too long been a divorce between the two subjects, although this is tending to diminish. In recent years the Medical Research Council has endeavoured to help this situation by offering studentships to highly qualified young men to enter the field of experimental pathology as well as clinical investigation. The best qualification for such men is undoubtedly a good training in physiology, and physiologists in general would find a greater opportunity for essential discovery if they realized that a study of abnormality of function often offers the key to the elucidation of the normal process. Harvey himself did not confine his observations to one aspect of his problem. When necessary he called up evidence from every branch then known of physiology, pathology, and clinical medicine to support his argument.

The Future of Medical Research

And now, what can be said of the future? Short of a catastrophic change which may upset or even destroy national life, the future of medical discovery is bright. Past experience shows that, whatever problem concerning the body can be formulated by the human mind, there is a possibility of a solution or partial solution to it being obtained. There is thus no doubt that more and more knowledge will be obtained, giving control, both preventive and curative, of disease. The limiting factor in this progress will always be the men of genius available who make the first-class discoveries, but it is probable that with the spread of educational opportunities to poorer people more of these men will present themselves. The money available for medical research will increase, and financial obstacles will almost certainly be removed as the work develops now that the State has put its hands to the plough. No insurmountable difficulty may be expected in the direction of finance if the situation is handled wisely.

The difficulty I foresee is not that of obtaining knowledge but of its application to human needs. Curative remedies as they appear will, as in the past, undoubtedly be generally taken up by the medical profession. Much of the new knowledge to be gained, however, may concern the prevention of disease, especially the prevention of chronic and degenerative conditions, including cardiovascular disease, rheumatism, and pulmonary disease. The adoption and application of this knowledge will generally depend on the degree of education and wisdom of individuals. In some cases it will involve Government action. Without an enlightened public opinion the average individual will do nothing to save himself or herself, and the State even less. If we are to continue as a successful democracy, dependent on public opinion for action, this must be guided suitably and quickly in problems of health as in other matters.

It seems to me that one of the most important functions of this Royal College in the future will be to lead public opinion and to guide State departments, especially in matters of preventive medicine. The Royal College of Physicians is an ideal body for giving guidance and to press for action, if such be needed, in cases where scientific discovery has supplied new knowledge of importance to public health. Its independence and freedom from political relations, and the high and honourable standing of its Fellows, would give its edicts an unassailable power.

I have now completed my task of giving a bird's-eye view of the modern movement of State support for medical research. It would be idle to pretend that the State or any other body could do much more in this matter than supply facilities to assist generally, and guide the natural genius of the country in studying problems relating to health and disease. Much remains to be done to improve and develop the movement, but, bearing in mind the limitations of any such enterprise, it will probably be agreed that the entry of the State into this field of discovery has been both stimulating and fruitful.

SOME ASPECTS OF RECENT WORK ON THE BACTERIOLOGY OF RHEUMATISM*

BY

H. J. GIBSON, M.D.

Pathologist, Royal National Hospital for Rheumatic Diseases, Bath

Reviews of the rheumatism problem appear with a regularity which is certainly not in keeping with the rate of advance of our knowledge of the subject, for rheumatism in its diverse forms presents an aetiological problem which is among the most difficult that medicine now faces. Consideration of its complexity suggests that entirely new conceptions of the host–parasite relationship may have to be evoked before the observed clinical, pathological, bacteriological, and serological results can be resolved into a comprehensive pattern.

For present purposes it is proposed to discuss the more recent work in its bacteriological and serological aspects, picking out certain salient and significant observations for more detailed consideration. As a starting-point the now well-known phenomenon of throat infection with *Streptococcus haemolyticus* followed by a latent period, which is in turn succeeded by an attack or relapse of acute rheumatism, will be considered. (Schlesinger, 1930; Collis, 1931; Sheldon, 1931; Coburn, 1931.)

Each phase has received careful study by Coburn (1932, 1935, 1936). The initial throat infection is often of very mild type, causing a slight rise of temperature, and in many cases it is overlooked by the patient. The presence or absence of tonsils does not affect the outcome, since a pharyngitis or nasopharyngitis clinically recognized as a feverish cold may be the starting-point for the rheumatic attack. Coburn and Pauli (1935d) have studied the characteristics of those strains which may be effective in producing a rheumatic relapse in susceptible subjects, contrasting them with strains which are non-effective in this respect. The effective strains were characterized by the capacity to produce strong erythrogenic toxins and haemolysins, and were in fact indistinguishable from scarlatinal strains. Those strains lacking in exotoxin production, although of human Group A and culturally similar to the effective strains, were not associated with rheumatic relapse. The toxins produced were not regarded as causative of the rheumatic lesions. On the contrary, a very low incidence of Dick-positive reactions was found among rheumatic children, and the erythrogenic toxin is

* Read in opening a discussion in the Section of Pathology, Bacteriology, and Immunology at the Annual Meeting of the British Medical Association, Plymouth, 1938.

probably neutralized as it is produced. The significance of exotoxin production appears to be as an indication that the organism is able to elaborate other soluble antigens. It may be that some hitherto unrecognized component is the effective agent in producing the rheumatic lesions.

The Latent Period

The latent period may next be considered. This may be very short, in which case the rheumatic attack follows at once on the respiratory infection. In the majority of cases the interval is from seven to twenty-one days, after which onset of fever, with increased sedimentation rate and development of clinical signs and symptoms, ushers in the rheumatic attack.

Studies have been made of the serological changes during the latent period. The antibodies found include precipitins reacting with protein fractions and antistreptolysins. In their earlier studies Coburn and Pauli (1932c) found that in normal individuals who contracted haemolytic streptococcal infection a slight concentration of precipitin appeared about four weeks after infection in the absence of rheumatic sequelae. In cases where rheumatism followed, the precipitin reaction was more definite. Schlesinger *et al.* (1935) have also noted this. They considered that the antibody-producing mechanism of rheumatic patients appeared to react more strongly to acute streptococcal infections than that of the non-rheumatic. They noted that the antibody content of the patient's serum was at its height just when a relapse was to be expected. Turning next to the anti-haemolysin, an antibody which is susceptible to accurate titration, we find similar results. Taking first non-rheumatic individuals, Coburn and Pauli (1932c) found that patients acutely ill with haemolytic streptococcus infection showed no change in titre but that a marked rise occurred during convalescence.

The same authors (1935f) confirmed this in rheumatic children. They showed clearly that in a group which developed rheumatic attacks the antistreptolysin titre rapidly rose to reach its maximum two to five weeks after the infection. On the other hand, failure to find a rheumatic relapse was associated with little or no rise of antistreptolysin titre even though the infecting organism possessed all the characters of an "effective" strain. They concluded that the greater the antibody response the more severe was the accompanying attack. As a corollary to this they suggested a conception of rheumatic disease as being the result of the following sequence: (1) infection with toxin-producing strains which initiates a process peculiar to rheumatic subjects; (2) antibody response, associated with (3) release of a substance, presumably from the antibody-producing tissues, which is toxic and which directly or indirectly alters mesodermal structures.

Coburn (1936) suggested that the rheumatic subject is characterized by a delayed development of antibodies. The evidence on which this conclusion is founded is not altogether clear. Thus in scarlet fever without rheumatic complication the maximum titre was found within seventeen days, while two cases of streptococcal infection with rheumatic relapse are quoted which showed a maximum on the twelfth and nineteenth days respectively.

Referring to the fact that some cases of pharyngitis are followed by rheumatism while others are not, Coburn stated:

> "In both types of subjects immune responses vary widely in degree, occasionally failing to appear. When antibodies develop in the normal subject they are not associated with disease, but the development of an immune response in rheumatic subjects is frequently accompanied by the appearance of rheumatic activity."

In view of these facts, with which most workers are in agreement, the only proof that a delay in antibody response is characteristic of rheumatism would appear to be a statistical one. It must be emphasized that delay does not imply deficiency, since the response was maximal, and increased progressively, in the more severe cases, and fall of antibody did not occur till after the disease had become clinically quiescent.

Persistent Infection by Haemolytic Streptococci

The presence of antibodies to high titre in the serum of cases of acute rheumatism irrespective of a history of *Strep. haemolyticus* infection has been amply corroborated by Todd (1932), who was instrumental in demonstrating the antigenic properties of streptococcal haemolysin, and by Myers and Keefer (1934); while Hadfield, Magee, and Perry (1934) have shown that the antifibrinolysin response follows a similar course. In association with the very definite epidemiological relation between haemolytic streptococcal infection and initial attacks of acute rheumatism as shown by institutional outbreaks (Bradley, 1932; and others), this serological evidence strongly suggests that a persistent infection with that organism is an important factor. That it is operative in every case is difficult to disprove, because the period during which the organism may be found on the respiratory mucosae is known to be a short one.

Failure to elicit a history of sore throat may be explained by the mildness of the condition, which is indeed a very characteristic feature of the prodromal infection. Thus we (Gibson and Thomson, 1933) were able to secure a history of respiratory infection within the three weeks preceding the attack in only 27 per cent. of the 119 rheumatic cases investigated in Edinburgh. As illustrating how extraneous circumstances may influence such an investigation, a year later over sixty post-scarlatinal rheumatic cases were treated in the hospital in which our series was studied. Thus a similar investigation on cases from the same population in the same hospital one year later would have produced an entirely different impression. Shapiro (1935) also could find no evidence that respiratory infection preceded the rheumatic attack in any large proportion of cases. Colds, sore throats, scarlet fever, and otitis accounted for only 30 per cent. of his cases. In 45 per cent. the onset was gradual without any evidence of infection. That writer records a number of instances where injury was followed by acute rheumatism after a latent period of some days. Wilson *et al.* (1934) from a study of convalescent rheumatic cases obtained evidence that did not support the conception of a specific aetiological relationship between respiratory infections and rheumatic fever in children. Thus less than 10 per cent. of the rheumatic attacks were preceded within three weeks by a respiratory infection. They further reported that two-thirds of the subjects experiencing rheumatic activity unassociated with respiratory infections did not exhibit a rise of antistreptolysin titre.

The failure of infections other than haemolytic streptococcal ones to activate rheumatism has been noted by Collis (1931) in the case of pneumococcal infection and Coburn and Pauli (1935b) in the case of influenza and chickenpox. Bland and Duckett Jones (1935), on the other hand, have reported pyelitis, herpes zoster, and a febrile reaction to the Schick test as being activating factors. They were also able to show repeatedly the phenomenon of latent period followed by relapse after the intravenous injection

of T.A.B. vaccine. Operations and accidents were found by these authors to act in the same way. Thus haemolytic streptococcal infection may not be the only activating factor. Conversely, haemolytic streptococcal infection in erysipelas does not appear to be capable of initiating the rheumatic process. This is indicated by Keefer and Spink (1937), who showed that the strains responsible were mainly toxigenic, with all the other attributes of "effectiveness" in the sense of Coburn. The immune response was also shown to be efficient by the rise of antistreptolysin and antifibrinolysin in the blood, and a marked delay in the fall of the former was noted.

To sum up, epidemiological and serological findings taken together provide a striking mass of evidence in favour of the aetiological relation of the haemolytic streptococcus to acute rheumatism. Contrary evidence gathered from sporadic cases, which by their nature are not susceptible to bacteriological study in the pre-rheumatic phase, is much less convincing; but the possibility cannot be ignored that there may be a group of cases which arise without a preceding acute haemolytic streptococcal infection. Such cases may be overlooked entirely if such infections, epidemic or sporadic, are made the starting-point for the collection and study of rheumatic cases, in all of which there will naturally be serological residua in the form of specific antibodies.

Theories of Aetiology

The full interpretation of these results is admittedly impossible. Rather they enable us to discuss hypothetical mechanisms by which the rheumatic response may be produced. Two alternative theories appear to fit the observed facts. Either the disease is an infection with *Strep. haemolyticus*—and this includes the possibility of chronic systemic infection of a type not now recognized—or some other specific rheumatic agent is primary and the streptococcus is to be regarded as merely one of a number of secondary inciting causes.

Theory of Chronic Haemolytic Streptococcal Infection

Direct evidence of this is slight. Organisms isolated from the blood, joints, and elsewhere have been mainly non-haemolytic types (Poynton and Paine, 1913; Clawson, 1925; Cecil, Nicholls, and Stainsby, 1929), and reports of such bacteriological observations are conflicting. In this connexion there are two circumstances which should be mentioned. First, the latent period allows time for the development of antibodies, and the *in vivo* culture medium of persisting organisms may become antagonistic to survival in their original form. The conditions are, in fact, those used artificially to enforce dissociation of other bacteria into variant forms. Secondly, in gonococcal infection of joints it is often found that the blood and joint fluid are sterile. This has been emphasized by Myers, Keefer, and Holmes (1934), who found, even in acute cases, that isolation of the organism from the joint fluid was only possible in 25 per cent. of cases. They concluded that the inflammatory reaction in cases with non-infected fluids is below the surface of the synovial membrane and in the periarticular tissues. They compared the non-infected effusion to that sometimes found in the pleura in pneumonia, the aseptic meningitis of extradural or brain abscess, and the sterile effusions in joint cavities in osteomyelitis. For these two reasons the failure to find organisms or the finding of types differing from those of the respiratory tract is not conclusive evidence against a generalized low-grade infection.

The failure to find bacterial products of primary toxicity has led to the theory of allergy, in which the specific element of the process is transferred to the tissues, the bacterial substance involved being an antigen of no primary toxicity, possibly derived from any of a number of bacterial types. The acceptance of this theory presupposes that we know all regarding the pathogenic potentialities of the streptococcus and that this knowledge will not explain how chronic infection with that organism could cause disease of the rheumatic type by the well-recognized modes of invasion or toxin production. Such an assumption is not justified. Within the last few years we have learned of antigenic haemolysin, fibrinolysin, capsule production as a general phenomenon among haemolytic strains, the Lancefield groups, and the Griffith types, and much evidence has been given that Dick toxin is manifold in its structure and perhaps also in its works. The antibody response so characteristic and of such a marked degree and duration in acute rheumatism may simply be an indicator of the diffusion of other exoproducts possessing specific toxicity which have yet to be defined. Recent work on the multiple toxins produced by *B. welchii* and their specific effects in a variety of animal diseases is an instructive analogy.

The allergic or hyperergic variant of this theory has recently acquired support from the histological and experimental studies of Klinge (1936) and others, and merits further comment. It has been stated in its most recent form by Swift, Moen, and Hirst (1933) as follows:

> "The primary haemolytic streptococcus infection is followed quickly by a state of antitoxic immunity, in contrast to a relatively delayed type-specific antibacterial immunity, and a state of bacterial hypersensitivity (hyperergy to streptococci) is concomitantly induced. With the development of partial immunity, the persisting streptococci are reduced to a state of relative avirulence for the individual, but continue to be active in the tonsils, lymph nodes, sinuses, and other tissues, where they set up focal infections, which are ideal sites for the further continuous stimulation of a hypersensitive state of the entire body. Moreover, the persistence of streptococci in these foci results in the elaboration of poisonous substances, either from the bacterial bodies or from the patient's tissues, or from both, which irritate and damage certain portions of the hypersensitive mesenchymal system."

In this form the allergic sequence resembles closely the phenomena which constitute chronic infection—for example, in syphilis or tuberculosis, where late manifestations are undoubtedly coloured by allergy. In such chronic infections the antigen circulates in the form of whole organisms capable of multiplying at the fresh sites of involvement. In rheumatism the suggestion is that bacterial products carried by the blood stream are the active agents producing similar widespread tissue changes without actual metastatic infection.

The hyperergic reaction probably has a place whatever the nature of the primary infecting agent, and is an important field of investigation which will certainly lead to a fuller understanding of the pathogenesis of the disease. The allergic conception of acute rheumatism was originally derived from the analogy between the latent period common to that disease and serum sickness. Schlesinger *et al.* (1935) have, however, pointed out that the same interval is noted between the initial infection and frankly septic complications such as otitis, meningitis, and adenitis, which are not regarded as allergic in any of the many senses of that term. Acute glomerulonephritis occupies an interesting position because it follows streptococcal infection after a latent period and a high serum antistreptolysin titre is of frequent occurrence (Seegal and Lyttle, 1933; Coburn, 1933).

A final word may be said on the therapeutic evidence bearing on the relation of *Strep. haemolyticus* to acute rheumatism. Coburn and Pauli (1935e) found that active immunization with Dick toxin neither prevented streptococcus infection nor inhibited the development of the rheumatic process. Passive immunization with serum did not modify the rheumatic relapse and possibly increased its severity. Sulphanilamide has been shown by Swift *et al.* (1938) to be definitely harmful in cases of established rheumatism. Under its influence in certain cases the pulse was more rapid, pyrexia increased, fresh joints became involved, nodules appeared, and pancarditis developed. There was no evidence that antistreptolysin production was influenced, and, on the contrary, rising antibody curves were noted after administration of the drug.

Swift points out that such incidence has no real bearing on the hyperergic theory because sulphanilamide is known not to be effective in chronic infections. Eason and his co-workers (1934, 1937) reported favourable results after the administration of large doses of scarlatinal antitoxin in established cases, but regard the effect as partly non-specific. Taken as a whole the therapeutic evidence does not support the streptococcal view-point, though it does not disprove it.

Theory of a Specific Rheumatic Infective Agent

The alternative of a specific rheumatic infective agent, possibly of virus type, is an almost equally satisfactory explanation of the facts as we know them. Such an agent might infect in childhood some 5 to 10 per cent. of the whole population. It would be characterized by latency, its presence only becoming clinically manifest when some incident such as infection (most frequently perhaps with haemolytic streptococcus), operation, or accident causes the balance of the symbiosis to be upset in favour of the parasite. This would account for the incidence of apparently new cases of rheumatism following outbreaks of scarlet fever or haemolytic streptococcal respiratory infection in about 10 per cent. of those attacked. That the rheumatic process may remain latent throughout life is shown by those cases which come to necropsy with scarred valves in the absence of any clinical history of rheumatism. It may be argued that the intense and prolonged antibody response to the exo-antigens of the streptococcus may be incidental and related to the inciting factor rather than to the primary cause of the disease. The rising curve of antibody titre extending over the whole period of rheumatic activity is, however, difficult to reconcile with this view. It may be noted that the persistence of the antitoxin giving rise to the Dick-negative state after scarlet fever is not considered to be due to continued activity of the streptococcus, and the same may be true of the antistreptolysin. There is, then, much to be said in favour of a specific rheumatic micro-organism or virus. The work of Schlesinger, Signy, and Amies (1935), Coles (1935), and Eagles, Evans, Fisher, and Keith (1937) along these lines is interesting, and forms a valuable positive contribution to the observed phenomena of rheumatism.

Obviously no conclusion is possible at this stage. Each theory which has been put forward conflicts to a greater or less extent with the available evidence. The problem may be restated but not answered.

Rheumatoid Arthritis

The relation between acute rheumatism and rheumatoid arthritis is a subject of much controversy. Clinically there is little similarity, but on the pathological side there is a good deal of evidence that the two diseases may be aetiologically related. One may perhaps recall that erysipelas and scarlet fever are separate diseases which show little clinical relationship and yet possess in common an identical ultimate bacterial cause. For a discussion of this question the reader is referred to the review by Dawson and Tyson (1935), in which a great deal of evidence is collected. Poynton (1938) deals in a similar way with the whole group of "rheumatisms."

With regard to rheumatoid arthritis it is proposed simply to mention one aspect of recent evidence, the demonstration of serum antibodies to the haemolytic streptococcus.

Cecil, Nicholls, and Stainsby (1931) reported the isolation of haemolytic streptococci from the blood and joints of a high proportion of cases of rheumatoid arthritis, and the agglutination of the strains by the patients' sera in high dilution was shown by Nicholls and Stainsby (1931). The isolation of the organism has been confirmed by some but not by other later investigations, but the agglutination reaction has been demonstrated by practically all who have repeated it.

The titres reached, up to 1 in 10,000 or more, and the duration of the response are far in excess of those associated with acute haemolytic streptococcal infection. Dawson *et al.* (1932) have studied the reaction closely. They reported that the agglutinins in their thermolability and increase with the age of the subject resemble the natural antibodies of normal sera rather than the immune agglutinins following immunization or infection. They are extremely wide in their valency, and practically any haemolytic streptococcus of human group A may be used to elicit the reaction, although some strains give a higher proportion of reactors than others. The antibodies produced are thus not specific for any typical strain of rheumatic origin, as was at first suggested by Nicholls and Stainsby (1931). They were found, indeed, to react also with R pneumococci, although the type of agglutination was different in certain respects. The reaction showed no parallelism with the plasma and serum protein changes which are so pronounced in rheumatoid arthritis and which account for the increased sedimentation rate. They did, however, show a considerable but not complete correspondence with the precipitin content of the serum when tested with protein and carbohydrate antigens of *Streptococcus haemolyticus*. The antistreptolysin and antifibrinolysin of rheumatic fever are not found in rheumatoid arthritis (Stuart-Harris, 1935; and others).

Levinthal (1938) has repeated this work at the Royal National Hospital for Rheumatic Diseases, Bath. Taking a strain of haemolytic streptococcus quite at random (Group A, Griffith Type 3) from the throat of a rheumatoid arthritis patient, and examining sera "blindfold"—that is, without any knowledge of the clinical condition present—he has found agglutinin in 71.5 per cent. of cases of rheumatoid arthritis, the reaction being strong in 51.3 per cent. His figures agree closely with those of Nicholls and Stainsby (1931), Dawson *et al.* (1932), Cox and Hill (1934), Blair and Hallman (1935), and McEwen *et al.* (1935). The reaction was negative in all but a very small proportion of other clinical types of chronic rheumatism. Of particular interest is the fact that cases of ankylosing spondylitis, by many regarded as a specialized form of rheumatoid arthritis, gave the reaction in only a very few cases. He has extended the work to a comparison of the agglutinins of joint fluid with those of blood. The observation has been made that there is a group of cases in which the test is positive in the fluid and negative in the blood serum. Out of eleven serum-negative cases eight showed positive reactions in the joint fluid.

It is argued that such joint-fluid antibodies could only have arisen from a local source—the disintegrating tissue of a joint—and that such a distribution (presence in tissue, absence in serum) is that associated with sensitization. The antigen continuously discharged from a focus of infection is unchecked by circulating antibodies and

reaches the tissue cells, where it reacts with their antibody, leading to a local anaphylaxis, the so-called hyperergic inflammation. Levinthal suggests that the basic lesion is a debility of antibody-forming mechanism which does not permit of that prompt response necessary for effective disposal of infection. He regards the micro-organism merely as a source of antigen, the streptococcus being operative in some 90 per cent. of cases, while other bacteria may be responsible in the remainder. Dawson *et al.* (1932) have shown that the formation of serum agglutinins in rheumatoid arthritis is a very slow process, requiring months of active disease before high titres are reached. He and many others have observed that the titres tend to fluctuate in a remarkable way on repeated tests. Following Levinthal's views, such periods of intermission would leave the tissues vulnerable to attack.

It will be noted that the evidence is explicable by a hypothesis which is essentially similar to that of Swift in the case of rheumatic fever. It assumes that the agglutinins are true immune antibodies, and their presence is accepted as evidence of the continued presence of the streptococcus, although Dawson *et al.* (1932) suggest that neither assumption is fully justified on available evidence. Again, the fluctuating serum titre may recede, leaving antibody temporarily locked in the joint fluid, a circumstance which would explain the combination of "serum negative; joint fluid positive" upon which the theory is based.

Space does not permit of any further consideration of the great mass of recent work on chronic rheumatism. Hench (1938) has examined the evidence critically, and concludes as a clinical investigator that it still remains to be proved that the disease is infective in origin; as a practising physician he has committed himself with reservations to the microbic theory. This is a perfectly accurate summing-up of the present unsatisfactory position. From epidemiological considerations we may be fairly certain that acute rheumatism is infective; even this is denied us in the chronic forms. But the present revival of interest in rheumatism must in the near future produce results which will do something to remove this uncertainty.

REFERENCES

Blair, J. E., and Hallman, F. A. (1935). *J. clin. Invest.*, **14**, 505.
Bland, E. F., and Jones, T. Duckett (1935). Ibid., **14**, 633.
Bradley, W. H. (1932). *Quart. J. Med.*, N.S., **1**, 79.
Cecil, R. L., Nicholls, E. E., and Stainsby, W. J. (1929). *J. exp. Med.*, **50**, 617.
—— —— —— (1931). *Amer. J. med. Sci.*, **181**, 12.
Clawson, B. J. (1925). *J. infect. Dis.*, **36**, 444.
Coburn, A. F. (1931). *The Factor of Infection in the Rheumatic State*, Baltimore.
—— (1933). *Amer. J. Dis. Child.*, **45**, 933.
—— (1936). *Lancet*, **2**, 1025.
—— and Pauli, R. H. (1932a). *J. exp. Med.*, **56**, 609.
—— —— (1932b). Ibid., **56**, 633.
—— —— (1932c). Ibid., **56**, 651.
—— —— (1935a). Ibid., **62**, 129.
—— —— (1935b). Ibid., **62**, 137.
—— —— (1935c). Ibid., **62**, 159.
—— —— (1935d). *J. clin. Invest.*, **14**, 755.
—— —— (1935e). Ibid., **14**, 763.
—— —— (1935f). Ibid., **14**, 769.
—— —— (1935g). Ibid., **14**, 783.
Coles, A. C. (1935). *Lancet*, **2**, 125.
Collis, W. R. F. (1931). Ibid., **1**, 1341.
Cox, K. E., and Hill, D. F. (1934). *Arch. intern. Med.*, **54**, 27.
Dawson, M. H., Olmstead, M., and Boots, R. H. (1932). *J. Immunol.*, **23**, 187, 205.
—— and Tyson, T. L. (1935). *J. Lab. clin. Med.*, **21**, 575.
Eagles, G. H., Evans, P. R., Fisher, A. G. T., and Keith, J. D. (1937). *Lancet*, **2**, 421.
Erson, J., and Carpenter, G. (1937). *Quart. J. Med.*, N.S., **6**, 93.
—— and Thomson, W. A. R. (1934). *Edinb. med. J.*, **41**, 583.
Gibson, H. J., and Thomson, W. A. R. (1933). *Edinb. med. J.*, **40** (Med.-Chir. Soc.), 93.
Hadfield, G., Magee, V., and Perry, C. B. (1934). *Lancet*, **1**, 834.
Hench, P. S. (1938). *A Survey of Chronic Rheumatic Diseases*, p. 35, London.
Keefer, C. S., and Spink, W. W. (1937). *J. clin. Invest.*, **16**, 155.
Klinge, F. (1936). *Acta Rheum.*, **8**, No. 30, 4.
Levinthal, W. (1938). *Proceedings of Rheumatism Congress*, Bath (in press).
McEwen, C., Alexander, R. C., and Bunim, J. J. (1935). *J. Lab. clin. Med.*, **21**, 465.
Keefer, C. S., and Spink, W. W. (1937). *J. clin. Invest.*, **16**, 155.
—— —— and Holmes, W. F. (1934). Ibid., **13**, 767.
Nicholls, E. E., and Stainsby, W. J. (1931). Ibid., **10**, 323.
Poynton, F. J. (1938). *A Survey of Chronic Rheumatic Diseases*, p. 25, London.
—— and Paine, A. (1913). *Researches on Rheumatism*, London.
Schlesinger, B. (1930). *Arch. Dis. Childh.*, **5**, 411.
—— Signy, A. G., and Amies, C. R. (1935). *Lancet*, **1**, 1145.
—— —— and Payne, W. W. (1935). Ibid., **1**, 1090.
Seegal, D., and Lyttle, J. D. (1933). *Proc. Soc. exp. Biol.*, N.Y., **31**, 211.
Shapiro, M. J. (1935). *J. Lab. clin. Med.*, **21**, 564.
Sheldon, W. (1931). *Lancet*, **1**, 1337.
Stuart-Harris, C. H. (1935). Ibid., **2**, 1456.
Swift, H. F. (1935). *J. Lab. clin. Med.*, **21**, 551.
—— Moen, J. K., and Hirst, G. K. (1938). *J. Amer. med. Ass.*, **110**, 426.
Todd, E. W. (1932). *Brit. J. exp. Path.*, **13**, 248.
Wilson, M. G., Wheeler, G. W., and Leask, M. M. (1934). *J. clin. Invest.*, **14**, 333.

ALCOHOL INJECTION IN INOPERABLE MALIGNANT GROWTHS OF THE JAWS AND TONGUE

BY

WILFRED HARRIS, M.D., F.R.C.P.

Consulting Physician, St. Mary's Hospital; Physician to the Maida Vale Hospital for Nervous Diseases

Carcinoma of the tongue and malignant growths in the facial bones, especially in the antrum, maxilla, and nasopharynx, whether they are called sarcoma, carcinoma, or endothelioma, are in the first instance naturally the affair of the general or of the ear, nose, and throat surgeon. Sometimes one of these cases in the initial stages presents itself as a case of neuralgic pain in the face, and there may be no clear localizing signs of growth. In this way I have seen early a few cases of nasopharyngeal growths, tumours of the bones of the base of the skull, and even antral growths invading the maxilla, though the obvious evidences of antral opacity in these latter should have been sufficient to side-track such patients from a neurologist.

It is not, however, of the early diagnosis of these difficult cases that I wish to write, but rather to draw attention to the terrible pain that many of these patients suffer in the later stages, perhaps after an excision of half the tongue or of the maxilla, or after treatment of a nasopharyngeal tumour by *x* rays, radium bomb, or radium needles. I have yet to see a nasopharyngeal malignant growth cured by surgical removal, and though radium treatment may cause temporary disappearance of the growth and great amelioration of the symptoms, yet recurrence after the lapse of a few months is the rule, and further treatment on the same lines is useless as the new growth now appears to be radium-fast.

When the surgeon in charge has decided that no further treatment can arrest the growth, it is then essential to render the remainder of the patient's life as bearable as

possible, and only too often analgesic tablets and finally morphine injections are considered the sole remedy.

It is in just these cases, where the malignant growth is invading the territory of the fifth cranial nerve, and where the growth has not spread into the neck or ear, that destruction of the Gasserian ganglion, and perhaps of the glosso-pharyngeal nerve also, may arrest the pain completely and give the patient comparative ease and comfort.

Illustrative Cases

From my case books I have picked out seven cases of malignant growth of the maxilla and antrum in which surgery failed to arrest either the growth or the pain, and in which alcohol injection of the Gasserian ganglion gave complete relief.

Case 1.—A woman aged 36 was sent to me by a surgeon in February, 1919, after he had removed the right maxilla for a malignant growth which had been causing severe constant pain for twelve months. As the pain was in no way lessened I injected the right Gasserian ganglion with alcohol by the lateral route, causing total trigeminal anaesthesia of all three divisions of the nerve. The pain was arrested at once, and ten days later the anaesthesia remained unaltered and there had been no return of pain.

Case 2.—A woman aged 65 had suffered for two years from pains in the left cheek shooting up the temple and across the cheek, and more or less constant. There was a perforating ulcer in the left palate posteriorly, and paresis of the left external rectus muscle. Hyperaesthesia to the scratch of a pin was noticeable over the whole left trigeminal area, though she stated that the left upper lip felt "rubbery." She was referred to me by an ear, nose, and throat surgeon in August, 1932, for alcohol injection, which I did, injecting the outer two-thirds of the Gasserian ganglion by the lateral route, with complete relief of the pain.

Case 3.—A man aged 70 was sent to me in November, 1933, by a surgeon for inoperable malignant growth of the right cheek and maxilla, causing intolerable shooting pains in the territory of the second division of the fifth nerve. The cheek was so scarred and tender that I used the lateral route in preference to the anterior for injecting the ganglion. It proved to be quite easy, taking only a few minutes to complete, and total trigeminal anaesthesia persisted. The neuralgic pains were at once completely relieved.

Case 4.—This patient, a man aged 52, was sent to me in June, 1936, by the same surgeon as in Case 2. He had complained for the past two months of severe pain in the left cheek, which was swollen and very tender. There was no anaesthesia of the face, though the skin was much mottled and atrophic on both sides following *x*-ray treatment for sycosis years before. Injection of the left Gasserian ganglion with 10 minims of 90 per cent. alcohol produced total trigeminal anaesthesia of all three divisions, with immediate cessation of the pain and tenderness.

Case 5.—A man aged 55 was seen in March, 1936, for pain affecting the whole of the left side of the head. For several months past he had had occasional bleeding from the nose, and neuralgic pain in the left side of the nose and across the cheek to the ear for three or four hours every afternoon. Turbinotomy gave no relief; another ear, nose, and throat surgeon found the left antrum opaque and removed a piece of growth, which was reported to be sarcoma. There was some numbness and partial anaesthesia of the left lower lip and half of the tongue, and also Eustachian deafness. The pain was controlled to a certain extent by taking sixteen veganin tablets daily. Alcohol injection of the outer two-thirds of the Gasserian ganglion was done by the lateral route on May 25, 1936, producing total anaesthesia of the left second and third trigeminal divisions, and immediate disappearance of all pain in the face.

Case 6.—In July, 1935, this patient, a man aged 59, complained of sore throat, and a piece of tonsil removed proved to be malignant. He was exposed to heavy radium treatment for 138 hours, and felt completely cured. Six months later the symptoms returned, and he was again similarly treated for fifty hours; in addition five radium needles were immediately afterwards inserted into the left tonsillar region for five days. Pain of a neuralgic shooting character started at once, and persisted continually afterwards in both left upper and lower jaws and side of the tongue, the pain spreading into the left ear and temporo-mandibular joint, with occasional intermissions. The jaws became fixed from contracture due to a radium burn close to the temporo-mandibular joint. It appeared to me that the acute onset of the pain immediately following the second heavy radium treatment was due to a trigeminal neuritis and probably glosso-pharyngeal neuritis, also secondary to the radium treatment. Left Gasserian injection, producing complete trigeminal anaesthesia, relieved the lower jaw pain, but neuralgia persisted from the ear to the maxilla and temple, probably glosso-pharyngeal in origin. This nerve was then dissected out behind the angle of the jaw and avulsed from its point of emergence from the base of the skull. Though his pain was relieved he unfortunately developed pyrexia and increasing weakness, dying three days later.

Case 7.—A man aged 73 had suffered from a chronic left antral discharge following an antral operation forty years previously. Severe pain in the left side of the face began in January, 1937, and when seen by an ear, nose, and throat surgeon a diagnosis of carcinoma was made. Deep *x*-ray therapy produced some improvement, though the pain was just as severe six months later. Radium needles were inserted, but the disease advanced, a large perforation in the palate being visible and the cheek being much swollen and discharging pus. The whole area of the cheek and jaw was intensely hypersensitive to touch. I saw him with his doctor on March 25 this year, and on the next day, under ethyl chloride anaesthesia, I injected his left Gasserian ganglion by the anterior route. Owing to the great swelling of the cheek the needle had to be inserted rather lower than usual, but no particular difficulty was encountered, and total trigeminal anaesthesia resulted. This persisted unaltered on the following day, when all the facial hyperaesthesia had disappeared, and the parts could then be handled with impunity.

These seven cases of malignant growth involving the antrum, maxilla, or tonsil illustrate the great relief to the pain that can be obtained by a well-placed alcohol injection in the Gasserian ganglion. No doubt the same relief could be secured by a sensory-root resection of the fifth nerve or by a trigeminal tractotomy, but owing to the severity of these open operations they will probably be generally held unjustifiable in view of the weak state of the patients and their short expectation of life.

Carcinoma of the tongue that is considered to be inoperable owing to spread of the disease in the floor of the mouth or from recurrence after operation or radium treatment also causes great suffering from pain in the face, which may be relieved by a less extensive injection than the type described above. Alcohol injection of the third trigeminal division at the foramen ovale will anaesthetize the area of the disease and give complete relief to the pain without pushing on the needle into the Gasserian ganglion. The anaesthesia of a well-placed injection should last as long as the patient's expectation of life.

Case 8.—In January, 1936, this patient, a woman aged 55, had been treated by radium needling for carcinoma of the tongue, but severe pain persisted along the left side of the mandible as far as the middle of the chin, and the tongue was very painful on moving. For the past twenty years she had complained of a "sore ear," being unable to sleep on that side, with pain around the ear following exposure to a draught. This I considered to be a "geniculate neuralgia" following a chill neuritis, though another neurologist who had seen her thought the pain was glosso-pharyngeal in origin and unsuitable for injection. However, alcohol injection of the foramen ovale ended her jaw and tongue pain completely, leaving

untouched the otic or geniculate neuralgia, to which she had become quite accustomed.

I have notes of three other cases of pain due to inoperable carcinoma of the tongue similarly treated by alcohol injection of the third trigeminal division, but their details are of no special interest.

Conclusion

I bring these cases forward to illustrate the great relief that it is possible to afford patients racked with the constant severe pain of inoperable growths in the tongue or jaws, by a treatment involving little or no shock, and one which can usually be done under local anaesthesia only.

RELATION OF HODGKIN'S DISEASE AND THE LEUKAEMIAS TO GASTRIC DISORDERS

BY

E. HARVEY, M.B., B.Ch., B.A.O.

Clinical Pathologist and Biochemist, Royal City of Dublin Hospital

Dr. Cramer's paper in the *Journal* of April 16, 1938 (p. 829), will, I hope and believe, prove a landmark in the history of our ideas with regard to the aetiology and treatment of at least certain forms of cancer. My observations, for whatever they are worth, entirely confirm all that he says with regard to gastric (and indeed intestinal) cancer. I have some reason also for thinking that Hodgkin's disease and the leukaemias may be diseases sequential to or coincidental with gastric derangement following on what Dr. Cramer aptly terms "insult to the gastric mucous membrane." I give a brief summary of five case histories.

Case I

In August, 1936, a casual labourer aged 32 was admitted to hospital complaining of severe vomiting coming on after every meal, with abdominal pain, rapid loss of weight, thirst, and diarrhoea. He had very much enlarged cervical glands and enlargement of glands in the left axilla, with a clean smooth tongue. His medical history told of removal of the appendix somewhat over a year previously. He proved to be a typical case of Hodgkin's disease. Examination of his blood showed: haemoglobin, 95 per cent.; red cells, 5,475,000 per c.mm.; white cells, 7,800 per c.mm.; neutrophil polymorphs, 57 per cent.; eosinophil polymorphs, 1 per cent.; lymphocytes, 42 per cent. His usual diet was stated to be: Breakfast—white bread and butter, very strong tea, sometimes an egg or bacon; dinner—stewed beef and potatoes, white bread and butter, very strong tea; evening meal—white bread and butter, very strong tea; supper—a repetition of the evening meal. Curiosity was evoked by this dietetic history, and a test meal was given. It showed the absence of free hydrochloric acid in all specimens. As a consequence of this finding it was thought worth while to try the effect of injections of campolon, in addition to the hospital dietary and deep *x*-ray treatment of the enlarged glands. How far the campolon helped him is only conjectural, but he improved much in his general condition, with loss of pain and vomiting, increase of weight, etc., so that eventually he left the hospital on the understanding that he would come weekly for inspection to the out-patient dispensary. His subsequent history, however, was that of sudden serious relapse necessitating immediate removal to another hospital, where, I fear, death ensued quickly.

Case II

A carpenter aged 37 was admitted to hospital in August, 1937, complaining of loss of weight and strength, with quick fatigability and frontal headaches following on an attack of influenza six months previously. There were also intermittent pains in the back and legs, with profuse perspiration at times, a tendency to constipation, and great distension after meals. He had a jaundiced colour, which he stated had been constant for five years previous to admission. The glands in the left cervical and right and left inguinal regions were greatly enlarged: the patient had first noticed them two months previously.

There was a previous medical history of measles, whooping-cough, and tonsillectomy. He had been "pernickety" regarding food all his life, with little appetite for dinner but a good appetite for breakfast and the evening meal. He was very fond of strong tea, had indulged heavily in whisky, and had some addiction to stout and the moderate use of tobacco. The urine for some time after admission was ammoniacal and was positive to Ehrlich's urobilinogen test. Blood examination showed: haemoglobin, 74 per cent.; red cells, 2,900,000 per c.mm.; white cells, 3,400 per c.mm.; polymorphs, 52 per cent.; lymphocytes, 48 per cent. Anisocytosis was somewhat marked. This would indicate pernicious anaemia, while the glandular condition was one of Hodgkin's disease. A test meal showed free hydrochloric acid and total acid within fairly normal limits. The patient was put on campolon and colliron, with deep *x*-ray therapy over the enlarged glands. He responded poorly to treatment. One month after admission examination of his blood showed: haemoglobin, 59 per cent.; red cells, 2,350,000 per c.mm.; white cells, 5,100 per c.mm.; polymorphs, 63 per cent.; lymphocytes, 37 per cent.; and megalocytosis. Later he sank rapidly and died.

Case III

In February, 1938, a signalman aged 59 was admitted to hospital complaining of a very large "lump" in the abdomen which was incapacitating him from work. On examination the "lump" was seen to be an enormously enlarged spleen extending well to the right of the umbilicus and down to the inguinal ligament. The liver was also enlarged about two fingerbreadths below the costal margin in the mammary line.

A blood examination on February 4 showed: haemoglobin, 69 per cent.; red cells, 3,320,000 per c.mm.; white cells, 214,000 per c.mm.; polymorphs, 3 per cent.; premyelocytes, 97 per cent.; slight anisocytosis and poikilocytosis. The diagnosis of myelogenous leukaemia was made. On inquiry a history of daily vomiting before breakfast for eight to nine years previously was elicited. His diet had been: breakfast—4 to 5 oz. of white soda bread, a plain boiled egg, two cups of strong tea with two drachms of sugar to each cup; 10 to 11 a.m.—4 to 5 oz. of white soda bread, one cup of strong tea with two drachms of sugar; dinner, 2 p.m.—potatoes boiled in jackets, fried steak up to 8 oz., cabbage or turnips cooked with soda, one cup of strong tea with two drachms of sugar; evening meal, 4 to 5 p.m.—same as for breakfast, omitting the egg. Occasionally oatmeal porridge with milk was taken for breakfast. No alcohol was drunk, but 1½ oz. of tobacco was smoked weekly. The history of vomiting, and the very avitaminous diet, with the strong tea superadded so constantly, led to a test meal being given. It showed no free hydrochloric acid in any specimen. The patient received hospital diet with deep *x*-ray treatment over the enlarged spleen. His white cell count decreased rapidly, and on March 30 a blood examination showed: haemoglobin, 85 per cent.; red cells, 4,700,000 per c.mm.; white cells, 4,500; neutrophil polymorphs, 22 per cent.; eosinophil polymorphs, 2 per cent.; premyelocytes, 76 per cent.; red cells, regular.

On April 7 a further test meal was given. Again there was no free hydrochloric acid in any specimen. Parallel to the decrease in the white blood cell count was the rapid

decrease in the size of the spleen. Eventually it was considered that the patient was fit to resume work, and he was discharged from hospital.

Case IV

In February, 1938, a herdsman aged 65 was admitted to hospital complaining of weakness, tiredness, and inability to work—the condition dating from several years previously. He was seen to have large discrete glands in the neck and axillae, with a slighter enlargement of the inguinal glands. Blood examination on February 9 showed: haemoglobin, 79 per cent.; red cells, 4,500,000 per c.mm.; white cells, 19,400 per c.mm.; polymorphs, 5 per cent.; lymphocytes, 95 per cent. A diagnosis of lymphatic leukaemia was made. The patient's diet had been: 6 a.m.—a cup of fairly strong tea with two drachms of sugar and a slice of white bread and butter; 9 to 10 a.m.—a rasher of bacon and two fried eggs, or two boiled eggs, plenty of white bread and butter, two cups of strong tea with four drachms of sugar; 2 to 3 p.m.—boiled bacon and cabbage or turnips or parsnips, potatoes boiled in jackets, rarely beef or mutton or fowl; 5 p.m.—white bread and butter, two cups of strong tea with four drachms of sugar; 8 to 9 p.m.—flaked oats porridge with 1 pint of milk, or porridge made with buttermilk. When at fairs—that is, about once a fortnight—he took a great deal of draught porter or whisky. He used 5 to 6 oz. of tobacco a week. A test meal was given; this showed no free hydrochloric acid in any specimen.

The patient was given deep *x*-ray treatment, and his white cell count on March 31 was 5,800 per c.mm., with 82 per cent. lymphocytes. The enlarged glands decreased a great deal in size as the result of the treatment, but he grew gradually weaker, and died on April 11.

Case V

A man 66 years of age, caretaker of a forest wood, was admitted to hospital towards the end of February, 1938, with a greatly enlarged spleen and a history of periodical attacks of vomiting with pain in the left side. He had had paralysis of the right side about two and a half years previously from which he had never wholly recovered.

Examination of the blood on February 23 showed: haemoglobin, 61 per cent.; red cells, 2,194,000 per c.mm.; white cells, 159,000 per c.mm.; neutrophil polymorphs, 31 per cent.; neutrophil myelocytes, 50 per cent.; eosinophil myelocytes, 1 per cent.; transitional myelocytes, 12 per cent.; lymphocytes, ? 6 per cent; nucleated red cells, 4 per cent.; anisocytosis and poikilocytosis. The diagnosis of myelogenous leukaemia was made and the patient was given deep *x*-ray therapy.

Inquiry into his diet seemed to show that there was nothing very unhygienic in his present mode of living, but he said he had always been able to eat well until lately, and that at one time he ate up to a pound of beefsteak at dinner. He had also in the past been taking stout very freely, and had smoked heavy "twist" tobacco up to 5 or 6 oz. a week. He was given a test meal on February 25, when no free hydrochloric acid was found in any specimen. Under *x*-ray treatment his white cell count fell to 32,750 per c.mm. on March 30, with 76 per cent. neutrophil polymorphs. His spleen also decreased in size under the treatment, but his general condition remained poor, and it was not considered advisable to give him further *x*-ray treatment for the present. He was advised to go home and come up later for inspection with a view to a repetition of the treatment if he was able to undergo it.

Comment

Here were five successive cases of glandular or splenic enlargement, all with dietetic histories which seemed to the clinical pathologist to warrant examination of test meals. In some cases there seemed to be positive abuse of the stomach by strong tea (and tea is often used in Ireland with very high tannic acid content), or alcohol, or tobacco, or excessive amounts of food, etc. In general, too, the diets of these patients tended to be very avitaminous. Anyway, in four out of the five cases the test meal showed complete achlorhydria, while in the fifth case, although free hydrochloric acid and total acid were present in normal amount, the patient's blood seemed to disclose a state of pernicious anaemia. The two cases of myelogenous leukaemia tended also to have a colour index greater than unity. The number of cases, no doubt, is too small for any generalizations to be made, but they seem well worth presenting in the hope that other clinical pathologists may be induced to examine patients suffering from Hodgkin's disease or leukaemia, with a view to eliciting the state of the gastric mucous membrane and the previous dietetic history. If any considerable proportion of such patients show gastric anomalies comparable to those now being recorded there will be fair justification for thinking that the aetiology of these diseases runs somewhat on the same lines as Dr. Cramer believes to be true in the case of cancer of the stomach (and intestine ?). Quite possibly, as in the case of cancer, we may have to consider how far a virus factor may also be involved. Dr. M. H. Gordon and his co-workers have adduced good evidence that a virus is at work in the case of Hodgkin's disease. Yet, as in the case of cancer—assuming the truth of Dr. Cramer's conception—it may be possible to *prevent* Hodgkin's disease in the future by a more strict attention to what dietetic hygiene is teaching us, or will teach us when its laws are more perfectly known. And the same may be true of leukaemias. Indeed, with regard to the latter, one cannot but think that they may be in some way analogous to pernicious anaemia. Just as in pernicious anaemia a degradation of the mucous membrane of the stomach (whatever may be *its* cause) makes the manufacture of haemopoietin impossible, with consequent inability of the bone marrow to produce mature red blood cells, so in the leukaemias some other anomaly of the gastric mucous membrane may be responsible for the flooding of the blood stream by the bone marrow with myelocytes or lymphocytes. We hope we shall yet learn to *cure* the leukaemias (and Hodgkin's disease) as we have learned to cure pernicious anaemia. If the work of van Rooyen regarding the effect of *x* rays on the virus of Hodgkin's disease *in vitro* is to be taken as correct, I fear we must turn our attention to the discovery of some other mode of treatment of that disease than by use of *x*-ray therapy. But meanwhile, or concurrently, we may perhaps learn to prevent it (and the leukaemias), just as Dr. Cramer thinks we ought to be able to prevent gastric cancer.

I am indebted to Dr. A. Parsons, F.R.C.P.I., physician to the Royal City of Dublin Hospital, under whose care the patients were admitted, for permission to write up these case histories in so far as they bear on the subject of this paper.

The University College Hospital report on radiotherapy for 1937, by Drs. Kenneth C. Eden and C. H. Offord, is upon the same lines as its predecessors. During the year under review the radiotherapeutic department has been entirely separated from that of radiodiagnosis. In general, the technique adopted remains the same as in previous years, except that the 1-gramme mass unit of radium has been replaced by a 2-gramme unit, and a new apparatus for superficial therapy has been installed to replace that which has been in use since 1920. During the period considered 567 patients were treated; of these 431 were new patients, including 290 cases of malignant disease. The total number of treatments given has risen from about 500 in 1930 to nearly 9,000 in 1937.

THE BIOLOGICAL SIGNIFICANCE OF THE TONSILS AND ADENOIDS AND OTHER EXTERNAL LYMPHOID MASSES

BY

PERCIVAL W. LEATHART, B.A., M.B., B.Ch.

Senior Surgeon, Eye and Ear Infirmary, Liverpool

In the wall of the pharyngeal cavity and intestinal canal numerous masses of lymphoid tissue are situated; they are not wholly enclosed in the tissues of the body, and for that reason may for descriptive purposes be termed "external lymphoid masses." Some of the larger masses have received names—the tonsils, the adenoid mass, and Peyer's patches; each is so situated that one of its surfaces is in contact with food or air, the remainder being buried in the tissues. Like other organs an external mass has an arterial and a venous blood supply through which it receives the material necessary for its special metabolism and from which by osmosis and filtration its lymph supply is derived. It possesses an efferent vessel through which lymph is conveyed to an adjacent node, but, unlike lymph nodes, it has no afferent lymph vessel. This anatomical peculiarity is of some importance, and will be referred to later.

The lymphoid tissue of the larger external masses is arranged so that folds alternate with fissures like the gyri and sulci of the cerebral cortex, or so that deep crypts lead inwards from its surface. Between the folds or in the crypts living micro-organisms are always found, except of course in the case of the newly born infant. It will thus be seen that an external mass has three salient features: (1) one surface is in contact with food or air; (2) it only possesses an efferent lymphatic channel which leads to the adjacent nodes; (3) the crypts contain living micro-organisms.

The Function of the External Lymphoid Mass

The external mass selects its inhabitants from food or air, and these flourish there to a greater or lesser extent. During its growth a micro-organism produces its specific toxin, which must be removed if growth is to continue. There are three routes by which this removal can be accomplished. The toxin may pass either (1) into the pharynx or intestine; (2) through the efferent lymph vessels into the lymphatic system; (3) direct into the blood stream. The following clinical evidence shows that the toxin is able to pass through the efferent lymph vessel into the lymph system and thence eventually into the blood stream.

It is well known that in the common air-borne infection called acute tonsillitis and in the food-borne infection typhoid fever, the external mass involved, be it tonsil or Peyer's patch, becomes inflamed, increases in size, and on it an exuberant growth of micro-organisms ensues. After a short interval the temperature of the body is raised, indicating that the toxins have passed into the blood stream. In addition, the lymph nodes in the vicinity of the external mass have become enlarged and sometimes tender. Since, as we have seen, an efferent lymph vessel passes from the external mass to the nodes we may conclude that the toxin has chosen this pathway into the lymphatic system and thence into the blood stream. It is not uncommon for nodes to suppurate, and when this occurs the specific organism in the external mass can be recovered from the abscess. Similarly the *B. typhosus* has been recovered from a Brodie's abscess and even from the "rose" spots in the acute stages of that disease. It is clear, therefore, that when inflamed an external mass admits not only toxins but also micro-organisms into the lymphatic system which may form colonies in lymph nodes. But living micro-organisms are also to be found in all healthy external masses, consequently their toxins too are being formed and removed unceasingly. It is obvious that the amount of toxin passed into the lymphatic system both in health and in disease bears a direct relation to that formed in the external mass at any given time.

Granted that an external mass is performing a positive function, we may define an external mass as one whose function is to cultivate micro-organisms deposited on its surface with the object of admitting some of them or their toxins, or both, into the lymphatic system and thus into the blood stream. The biological application of this definition will be clear from a consideration of the following facts.

It will readily be conceded that the common air-borne and food-borne infections are of more frequent occurrence in childhood than in adult life, that the child as he advances to the adult state contracts fewer and fewer infections, in spite of the fact that he is living generally under the same conditions as to food and air. He has by means of repeated infections and recoveries established an immunity, partial or complete, to many of the infections that still attack more particularly the younger members of the community in which he happens to live. The process by which this result is achieved may be termed "auto-immunization," the biological importance of which is evident, for by this means the adult population becomes relatively immune to infection current among the younger members of the community.

Particular stress is laid upon the fact that although any organism may be deposited upon an external mass, that external mass will only cultivate those to which the immunity of the individual is low or absent. In the case where immunity is complete, sufficient concentration of antibodies is present in the blood stream to prevent growth of organisms in the external mass. On the other hand, when immunity is low, growth takes place, toxin is absorbed, metabolic disturbance ensues, and the necessary antibodies are produced. It is clear, therefore, that external masses are extremely valuable organs and have a highly important biological function to perform in the establishment of a healthy adult population by auto-immunization of the growing child.

The Clinical Significance of Enlarged Tonsils and Adenoids

The removal of tonsils and adenoids is perhaps the commonest of all surgical procedures. Let us therefore review the situation with regard to the removal of tonsils and adenoids, bearing in mind clearly the function as defined above, its biological significance, and its medical implications.

At the present time children are often referred for removal of tonsils and adenoids for one or more of the following reasons: (1) enlarged tonsils alone; (2) enlargement with recurrent colds and mouth-breathing; (3) recurrent attacks of tonsillitis; (4) enlarged adenoids with chronic catarrh or suppurative otitis media. The operation is often performed when any one of these conditions is present, without a thought being given to the biological value of the tonsil and adenoid or to the ill effect which early removal may have on auto-immunization. In the first class of case, enlargement alone, there are frequently no other symptoms. The child is often sturdy and well nourished: his tonsils are enlarged because an organism is

present to which immunity is required in the interests of his future health. Auto-immunization is progressing satisfactorily, and when complete the tonsil will shrink in size from an enlarged, soft, succulent functioning organ to the fibrosed and atrophied organ of the adult.

In the second class of case the position is more complicated. Two additional conditions are present: these are frequent colds and nasal obstruction. It is generally taught, and believed, that both conditions are caused by an adenoid mass obstructing the post-nasal space—so much so that the term "adenoid facies" has crept into the literature. An adenoid mass large enough to obstruct an airway is certainly sometimes found, but, on the other hand, it is not unusual for almost complete nasal obstruction to exist although there is only a very small adenoid mass present, or for nasal obstruction to persist after its surgical removal.

What is nasal obstruction due to in these cases? Thorough investigation reveals (1) that nasal obstruction is due to rhinitis with congested and hypertrophied turbinals; (2) that on transillumination the sinuses are duller than normal on one or both sides. This has been confirmed repeatedly both radiologically and by exploratory puncture. The latter physical sign is invaluable, and is invariably present in such cases, being diagnostic of catarrhal sinusitis, and accounting for the rhinitis and the congested and hypertrophied turbinals so often seen in these children. This, therefore, would appear to be an adequate explanation of such cases of nasal obstruction. It is true that removal of adenoids in such cases sometimes restores nasal breathing and allows the catarrhal sinusitis to clear up; but this happy result is by no means common—failures are often experienced. It is doubtful, even in the apparently successful cases, whether permanent benefit has been secured. In any event an organ of biological value has been removed.

That catarrhal sinusitis should be diagnosed is important, for, apart from the symptomatic relief its cure affords, this condition is the precursor of many other medical conditions which lead to chronic ill-health, such as bronchial asthma, bronchitis, and bronchiectasis. It is also a direct cause of discharging ears and middle-ear deafness. It has been found that the conservative methods adopted at the Royal Liverpool Children's Hospital in preference to the radical removal of adenoids have yielded excellent results during the last few years.

A Plea for the Conservative Treatment

The treatment referred to is the administration of small doses of potassium iodide over a period of three months—1 to 3 grains once a day, according to the age of the child. Potassium iodide causes an increased secretion from the mucous membrane of all the nasal sinuses, as is evidenced by the greater amount of watery discharge seen in cases of catarrhal sinusitis so treated. Given over a period of at least three months it is an excellent "nasal aperient." As will be seen from the accompanying table there are failures, but the results as a whole compare favourably with those treated in a more radical manner. In 70 per cent. of those so treated it was seen that cases of enlarged tonsils and adenoids with nasal obstruction were transformed to cases of enlarged tonsils and adenoids only. Where no improvement was observed operation was considered.

In the third type of case, in which there are recurrent attacks of tonsillitis, it is difficult to make a decision for or against operation. It should always be borne in mind that the child is acquiring auto-immunization through repeated mild infections. Of course it is impossible to say how many attacks of tonsillitis will produce such an immunity. In the routine examination transillumination should never be omitted, and if this should reveal a concurrent sinusitis this condition should be treated as outlined above, before any operative measure is warranted. In the case of recurrent tonsillitis without a sinusitis, more especially in the adolescent and the adult, we must come to the conclusion that the tonsil is now harbouring an organism to which that individual cannot acquire an immunity. Here operation is advisable.

In the above category two other classes of case fall—namely, rheumatic fever and nephritis which are not responding to treatment. Here again auto-immunization has given place to auto-intoxication, and, such being the case, removal of tonsils is urgently indicated. It will be noted that both conditions usually begin as a tonsillitis; that when the case is examined either the initial tonsillitis is not apparent or the acute stage has passed off and consequently the tonsillitis cannot be detected by inspection only. However, enlarged and/or tender glands can invariably be detected in the anterior triangle, showing that the micro-organisms or their toxins (or both) responsible for those conditions are still being absorbed and damaging the kidney or the heart. It is clear that in such cases removal of the tonsils which are harbouring these organisms is now a necessity.

The remaining indication for removal of adenoids is in those cases of chronic catarrhal otitis media and persistent otorrhoea where it is claimed by some clinicians that the enlarged and infected adenoid mass is retarding the improvement of the middle-ear infection.

Cases Operated on after Potassium Iodide Treatment

Period Under Review	No. of Cases Under Observation	No. of Cases where Operation was Primarily Indicated	No. of Cases Operated on After Potassium Iodide Treatment
1928	426	9	170
1929	369	19	141
1930	300	11	83
1931	376	9	105
1932	358	22	76
5 years ..	1,829	70	575

The cases operated on after treatment with potassium iodide, excluding those in which operation was primarily indicated, amount to 30 per cent. The number successfully treated by potassium iodide is 70 per cent.

Conclusions

1. That the function of an external lymphoid mass is to collect micro-organisms from food or air and to grow those to which an immunity is needed.

2. That the condition "enlarged tonsils" alone is definitely an indication against their removal.

3. That the adenoid facies is more commonly caused by catarrhal sinusitis than by an adenoid mass.

4. That catarrhal sinusitis can be treated successfully in a large number of cases without operation, by giving a "nasal aperient."

5. That tonsils and adenoids at the present time are removed too frequently and without due consideration of their important biological function.

6. That many cases of rheumatic fever and acute nephritis that are going downhill can be cured or greatly benefited by removal of the "carrier organ."

Clinical Memoranda

Idiopathic Epilepsy from Another Aspect with Treatment of the Fit

It has been an accepted fact for many years that the epileptic fit is the result of a sudden discharge of nervous energy from the cerebral cortex. However, apart from certain reflex phenomena, such as worms in children, no cause has been described either clinically or pathologically.

Bearing in mind the absence of any constant pathological cerebral changes, and viewing the condition from all aspects, one cannot help being struck by the features which are the manifestations of the phenomenon known as the epileptic fit. These features are the uniformity in the characteristics of the prodromal symptoms and of the fit itself, these being very similar, if not identical, in the one individual. This orderly sequence of events suggests that the fit is a response to some unknown stimulus of equally unknown *modus operandi*, and therefore that the fit is really a phase of reflex activity in response to an exciting cause, the aura being merely the distant impressions caused by the mobilizing of a vast army of nervous impulses, the discharge of which may in reality be a protective mechanism on the part of the body.

What of the possibility that this unknown stimulus produces a spasm of certain of the arterioles supplying the brain substance, the local anoxaemia so caused being responsible for the generation of impulses which on discharge cause the convulsions? If this be the case it may be analogous to the convulsive movements seen in asphyxia just before the stage of exhaustion. To test this theory it was resolved to experiment with the well-known vasodilator amyl nitrite in the next case seen.

Experimental Cases

This patient was a girl aged 11 with a history of epilepsy from early childhood. The attacks usually occurred monthly, and the common method of administering a general anaesthetic had always been employed. According to custom, the child was put fairly deeply under with ethyl chloride and maintained thus for some minutes. On regaining consciousness she appeared to have recovered, and, the parents being satisfied that the fit was over, further attention was unnecessary. Seven hours later there was another call to the child, who, after sleeping quietly for some hours, had another fit, and when seen was in status epilepticus. It was then resolved to try out the above theory of vascular spasm. One 3-minim ampoule of amyl nitrite was broken and held for the patient to inhale. A dramatic effect followed. The attack ceased almost immediately and, after regaining consciousness for a few minutes, the patient fell into a deep sleep.

Following this apparent success, an ampoule was given to a man, aged 35, who invariably had a fit when the moon was full. He was instructed to use the drug immediately he experienced the aura, and also to inform a relative of it. Unfortunately the patient's aura never gave him adequate warning. However, his mother administered the drug, with the satisfying result that he recovered in about a quarter of the usual time.

Although my experiments have been very limited, I thought it worth while to record the cases in the hope that the drug might be tried on other epileptics, especially those whose aura gives them fair warning of the approaching fit, and thus render them a service similar to that experienced by those who suffer from angina pectoris.

Edinburgh. Robert G. Linton, M.B., Ch.B.

Reviews

ELECTRICITY IN THERAPEUTICS

Traité d'Électroradiothérapie. By L. Delherm and A. Laquerrière. Volumes I and II. (Pp. 2,015 (both volumes); 450 figures. 480 fr.) Paris: Masson et Cie. 1938.

These two volumes form a most interesting and valuable contribution to medical literature. The title does not indicate, as might be thought, a new method of treatment, but has been adopted by the editors, Dr. Delherm of Paris and Professor Laquerrière of Montreal, to express the comprehensive nature of the work, which is designed to include all therapeutic uses of electricity, whether direct or indirect. Containing over 2,000 pages it is written by more than ninety contributors, each of whom is an expert in the particular subject of which he writes. A preface—reproduced in facsimile—is contributed by Professor d'Arsonval, whose experimental work on the physiological action of high-frequency currents has been so fruitful in the modern developments of electrotherapy. Like many other scientific discoveries, d'Arsonval's work was not at first appreciated at its true value, but, unlike too many pioneers, he has had the gratification of receiving the honour which is his due, and of witnessing the enormous progress in therapeutic procedure which is the direct result of his discoveries.

The present work contains excellent introductory sections on the more purely scientific aspects of the subjects considered, which include heat, light, ultra-violet radiation, *x* rays, radium, ordinary electrotherapy, and electrosurgery. The editors have exercised a nice discrimination in their choice of material, and omitted consideration of those elementary physical facts which should already be familiar to all who have received a medical education. In the accounts given of the biological effects caused by exposure to *x* rays and radium there is one statement with which we are unable to agree—namely, that nerve cells, even when they are in process of development, are almost completely immune to the action of *x* rays and radium. Recent work has shown that manifest histological changes can be set up in these cells[1]: the remarkable fact is that these changes, even when extensive and considerable, do not seem to be associated with corresponding interference with the normal life of experimental animals. Such a dogmatic statement as "radioresistance of nerve cells is almost complete" (p. 470) tends to obscure the need for further experimental work upon a highly interesting physiological phenomenon. Not only have these changes been found in the cells of the central nervous system but also in Auerbach's and Meissner's plexus, and indeed it has been suggested that this may be a contributory factor in the causation of some forms of radiation sickness.

In the clinical sections the subject-matter is mostly grouped regionally; the various forms of physical therapeutics are systematically discussed and the possibilities of their combination considered. There is a brief but excellent section on electrosurgery, in which the types of current suitable for different purposes, such as electrocoagulation and electrodissection, are described and illustrated by a series of diagrams. Throughout the book the illustrations and diagrams are excellent and well selected, and they fulfil their purpose of really illustrating the text. Although primarily intended for workers in highly

[1] *Brit. J. Radiol.*, 1936, **9** (N.S.), 620; 1937, **10** (N.S.), 549.

specialized fields, others will find it a valuable book of reference, which is greatly facilitated by a copious index and the regional arrangement of subject-matter. In conclusion the editorial secretaries, Dr. Morel Kahn and Dr. H. Fischgold, must be congratulated upon the successful accomplishment of a task the magnitude of which needs personal experience for its true appreciation.

THE INITIAL LESION OF PHTHISIS IN THE ADULT

Der Beginn der Lungentuberkulose beim Erwachsenen. By Dr. H. Braeuning. (Pp. 222; 87 figures; 20 tables. RM. 22; bound, RM. 24.) Leipzig: Georg Thieme. 1938.

Among the problems in tuberculosis still awaiting solution none is more important than that of the development of the initial lesion of phthisis in the adult. The excellent monograph by Dr. Braeuning is a valuable contribution to the study of this problem. In the course of following up a very large number of patients at Stettin, Dr. Braeuning was able to collect serial radiographs of 226 persons in whom a tuberculous lesion developed some time after a normal *x*-ray film had been obtained. He points out that to achieve the utmost value from such an investigation only cases should be chosen in which the interval between normal and abnormal radiological appearances was no longer than four months. This condition, however, obtained in only twenty-one persons. He was therefore obliged to extend the interval, and the present study is based on eighty-six individuals in whom the interval between a normal radiograph and one showing a tuberculous lesion was as long as twelve months (in one case the interval was twenty-one months). A detailed account is given of each of these patients from the moment he first came under observation as a healthy person, including data of environment and course of the disease after the lesion had appeared. This material is analysed in an attempt to discover the relative importance of factors that may play a part in the development of the pulmonary lesion, the manner in which the lesion appears, its subsequent course, and the effect on the latter of therapeutic measures.

Dr. Braeuning uses an attractive and very helpful method of representing diagrammatically the essential items in each case, and the reproductions of the *x*-ray films are as near perfection as we have seen, much use being made of reproduction in natural or almost natural size of parts of the lung fields. Every tuberculosis physician should see and read this book.

CLINICAL NOTES ON CHILD LIFE

Common Happenings in Childhood. By Sir G. Frederic Still, K.C.V.O., M.A., M.D., Hon. LL.D., F.R.C.P. (Pp. 180. 5s. net.) London: Oxford University Press. 1938.

The literature of children's diseases already owes much to Sir Frederic Still, but his latest contribution to it, *Common Happenings in Childhood*, is not the least valuable. The basis of the book as stated in the preface is "a consideration of some everyday phenomena in the life of the child and of their relation to disease or ill-health." Chapters are devoted to such "happenings" as crying, laughter, temper, tiredness, appetite, and fear, and there is also a study, the longest and one of the best, of sleep. The final chapter is on school, which, although not exactly a "happening" in the sense of the other subjects dealt with, plays such a large part for good or ill in child life. In it the author points out the many ways in which health may be injured by an often all too strenuous school routine, and what he says in this regard might well be taken to heart as a warning by many enthusiastic educationists.

Each "happening" is considered from the clinical standpoint, and is abundantly exemplified by case histories drawn from the author's notebooks. These exhibit a remarkable power of minute and accurate observation. For example, in the chapter on laughter it is stated that in making a diagnosis in a difficult case of early tuberculous meningitis "if a real amused smile can be provoked" it is very unlikely that meningitis is present. Elsewhere we read that the absence of tears in that disease is "so noticeable a feature" that it may be considered a small point in favour of the diagnosis. Other illustrations of like clinical acumen are the remarks that drowsiness as a late symptom in bronchopneumonia is of bad prognosis and that a bout of laughter or of prolonged screaming may sometimes usher in an epileptic fit. Almost every page contains similar shrewd observations, and it is interesting to note that so experienced a paediatrist agrees with the older physicians—and with all mothers and nurses—in attributing many of the disorders of childhood to teething, while constantly he emphasizes the importance of digestive troubles in the production of fears, ill-temper, tiredness, or disturbed sleep.

The book exhibits throughout a real love and understanding of children combined with mature clinical wisdom. It may be read and pondered with profit not only by doctors but by anyone who has much to do with children, whether well or ill; and not with profit alone but with real pleasure, for it is written in the agreeable and scholarly style and with that wealth of apt quotation from literature, ancient and modern, which we have learned to expect from its author. Every reader of it must wish that Sir Frederic Still may be moved to give us further gleanings of a similar sort from his great store of experience.

A STUDY OF CONCEPTUALISM

Human Powers and their Relations. By K. W. Monsarrat. (Pp. 289; 60 figures. 10s. 6d. net.) London: Hodder and Stoughton; Liverpool: University Press of Liverpool. 1938.

In a previous work, *Human Understanding and its World*, Mr. K. W. Monsarrat set himself to probe the philosophic difficulties that beset men of science as to how processes arise by which they interpret the conclusions to which they come. He endeavours to dissect, in the present volume, the human power of idea-forming in its psychological and biological aspects. Science has reached the stage of questioning the traditional uses of ideas and the powers that form them, and the proper manner of employing these powers is as great a problem as that of recording them. The habitual modes of idea-forming place the student in the dilemma of a want of conceptual relation between "matter and body" and "influence and action." The author examines the ways in which common sense, physics, and biology behave when faced with this dilemma, and finds that none of these factors can solve it because there is no difference in the modes of thinking employed by scientists who use them. He discusses the relation of knowing to the events in the human system by which it formulates ideas and reports, and then deals with the general application of ideas to particular events. Idea-forming requires two sets of powers: first, the power to use proper words to describe accurately what is done, seen, and heard; and, next, the power of forming an

accurate and comprehensive view of what is being regarded. But there are difficulties in the way of fitting oneself as an idea-forming individual or unit in a unitary fashion with what one seems to find, and it therefore becomes necessary to discover the most appropriate means of using one's powers before proceeding further. The author seeks to analyse and place in different categories all these appropriate means, and does so in a wealth of words, examining and criticizing all the methods by which human idea-forming words are evolved. He maintains that "man never discovers what any happening is absolutely, but only what it is according to his specific and limited powers of imaging." It might be illustrated thus: if A strikes B and sees him lying on the ground A can say, "I did that." To A his own action is the one "cause" and the image is conceived as one which this "cause" has effected. It may be a tale of the event, but it is not representation, for A has left out of conception and report his opponent's share in determining what has happened. So when A says "I did that" he is indulging in imperfect representation, for he has disregarded events in which he had no share.

The whole book is a close and detailed examination of conceptualism, in which Mr. Monsarrat employs his didactic powers in the realms of psychology and biology to penetrate Nature's secret of how human beings formulate ideas and apply them and how the interpretation of terrestrial events can be tested in terms of the assemblage of dynamic units or, in other words, human powers. This volume can only be read in a spirit of studious concentration. One could wish that the chapters had been less diffuse and that more analogies could have been introduced to illustrate the workings of the author's mind. Much of what he writes is cryptic and abstruse—but so is the whole subject. It is a courageous attempt, nevertheless, to unravel the mysteries of how the human brain begets ideas and to elaborate the whole logic of thinking.

ORAL SURGERY

A Textbook of Exodontia. Exodontia, Oral Surgery and Anaesthesia. By Leo Winter, M.D., D.D.S., Sc.D.Hon., LL.D. Third revised edition. (Pp. 502; 446 figures, 2 coloured plates. 42s. net.) London: Henry Kimpton. 1937.

In the new edition of his work on tooth extraction and oral surgery Dr. Leo Winter has attempted to incorporate, "as a result of recent experiments, only such available knowledge as has met satisfactorily the anticipated scientific requirements of dentistry." Here the author is thinking of the latest findings in the field of local anaesthesia and calls special attention to "cobefrin" (which might well figure in the index). Cobefrin, a Bayer product, is *o*-dioxyphenylpropanolamine, and while possessing marked ischaemic properties is free from the dangers of adrenaline. Winter says that it can be used in hyperthyroidism and heart disease, or in arteriosclerosis and high blood pressure. The chapters devoted to local anaesthesia and its possible accidents are a valuable contribution to dental literature; in particular may be mentioned the "carpule system" of injection. We note with interest the Winter appliance for splinting fractured jaws, though, since this depends on wires passed between and round the teeth for its retention, we cannot help doubting its cleanliness. Cysts are shortly, perhaps too shortly, dealt with. We note the recommendation to use "pariphor" paste, consisting of parathesin as an anaesthetic and rivanol as germicide, is accompanied by the statement that parathesin is practically insoluble—how, then, can it act as an anaesthetic? The larger part of the book is devoted to extraction of teeth and deals with both normal and abnormal conditions. Here the use of "overhead" forceps, in place of the hawksbill type in use in England, for the removal of lower teeth is noteworthy, and there is a wealth of *x*-ray pictures illustrating difficult extractions, and of wood-cuts illustrating the flaps appropriate to such cases and the manner of using specially devised elevators. We should like to see a fuller discussion on root variations and disease conditions of roots and bone in relation to extraction, though scattered references show that the author is fully alive to them.

Notes on Books

Dr. H. I. Schon, in his monograph, *Some Investigations into the Physiology of the Emotions* (Oxford University Press, 8s.), analyses the disturbances in function that are produced by moderate emotional upsets. The acceleration of the pulse rate of a nervous patient by some minor exciting cause, such as the presence of a strange doctor, is a very familiar clinical fact. On the other hand, it is not always remembered that a procedure such as the taking of a basal metabolic rate or a fractional test meal is a serious ordeal to a nervous person, and that the derangement of function caused by the consequent emotional disturbance may prove a very serious source of error. The author investigated a series of patients in a sanatorium for nervous disorders whom he regarded as emotionally labile. He found that slight, mixed emotions could increase the basal metabolic rate by 23 per cent. The taking of repeated test meals showed that achlorhydria was often present on the first occasion, but that normal figures for acid were obtained later, when the patient had become accustomed to the procedure. In such cases, however, any emotional disturbance that was intentionally introduced would greatly decrease or even abolish the acid secretion. Slight emotional disturbance could produce a rise in blood sugar lasting more than an hour. Dr. Schon's findings demonstrate the powerful influence of emotions on the results of routine methods of clinical examination. He discusses briefly current theories regarding the mechanism by means of which the emotions affect the autonomic nervous system.

Fundamentals of Biochemistry with Laboratory Experiments is the full title of a book by Carl L. A. Schmidt and Frank Worthington Allen, Ph.D. (McGraw-Hill Publishing Company, 18s.). Primarily designed for the student engaged in laboratory work, it furnishes a suitable and solid background for such work. Technique, while included in moderate proportion in descriptions of illustrative experiments, is a secondary consideration, and the book is by no means a laboratory guide. The fact that technique is regarded as incidental is adequate explanation for the comparative dearth of diagrams of apparatus, but at the same time it would likewise have afforded good reason for the omission of some of the very elementary laboratory directions which appear at the beginning. For the most part the book is clearly and simply written, formulae are generously employed and conspicuously set out, though that for testosterone is erroneous. The big subjects of modern biochemistry, the vitamins and hormones, are necessarily compressed, which perhaps accounts for the abrupt, staccato style in these sections. Style, however, is at its poorest in the introduction to the chapter on mineral metabolism, where the word "water" is repeated almost *ad nauseam*. Strong emphasis is laid upon the physico-chemical foundations of the subject, and the student is thoroughly familiarized with the basic calculations by being taught to work from examples. Moreover, every encouragement is given him to consult the original literature, and throughout carefully selected books and papers are cited to which he can refer,

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY OCTOBER 22 1938

HARVEIAN ORATION, 1938

The work of William Harvey gave the first and greatest example of the advancement of medicine by the method of experimental research, and it is fitting that Sir Edward Mellanby, in his Harveian Oration before the Royal College of Physicians on October 18, should have used the occasion to take stock of the present position of medical research in this country, and to consider the effect upon it of organized promotion by the State, through the annual grant administered by the Medical Research Council. By an interesting but unforeseen coincidence, Sir Henry Dale, in his address to the students of Guy's Hospital Medical School last week, dealt with some of the same features of current development as are treated by his colleague in the Harveian Oration. It is a quarter of a century since the Medical Research Fund was created, in 1913, as a by-product of the National Health Insurance Act. There are those who will remember the doubts expressed at that time concerning the effects of the new departure, even by some who had earlier been prominent in criticism of the lack of State support for research in the field of medicine. It was feared that the administration of the new fund, by a body appointed by a departmental Minister, might result in the regimentation of research by officialdom, and the direction of its activities into channels determined by convention or by political expediency, to the neglect and discouragement of individual enterprise and genius.

Sir Edward Mellanby deals with the constitution of the Medical Research Council, predominantly of men chosen for personal achievement and experience in medicine and research, and with the changing composition which ensures against any lasting bias in their judgment of what is worthy of support. He mentions also the important provision which left to the Committee, and later to the Council with the approval of the President of the Royal Society, the nomination of their Secretary. He naturally gives less emphasis to the fact, of immense importance to the success of the work of the advisory body, that the two men who have hitherto held this chief executive position have been chosen for their first-hand knowledge of the needs of medical research, being themselves distinguished discoverers in the medical field, as well as for personal and administrative qualifications. The nomination by the original Committee of the late Sir Walter Fletcher as their first Secretary, in 1914, must, in any case, have had a far-reaching influence on the early development of their policy and the creation of a tradition. The importance of the appointment was immediately enhanced, however, by the fact that the outbreak of war followed hard upon it. The Chairman and the members of the Committee found their time and their interests deeply engaged in various activities, and it meant much for the immediate national need, and for the future of State support for medical research, that the task of organizing the application of the Fund to the new demands for medical research under war conditions found in Sir Walter Fletcher a man of inspiring personality, with the highest scientific ideals, and a tireless energy and enthusiasm in making them effective in administration. When the war ended his wisdom and foresight exercised a central influence in obtaining for the new Council its present chartered constitution, with the safeguards which a short but crowded experience had suggested. The Council had been able through the fifteen following years to develop its peace-time programme with general approval, and the early forebodings of the effect of State interference on research had long been forgotten, before Sir Walter Fletcher's lamented death. Faced with this sudden and tragic loss to their organization, the Council were indeed fortunate in finding, in Sir Edward Mellanby, another man of brilliant distinction in medical research, willing to accept the heavy administrative responsibility, and to carry on the already great tradition as their Secretary.

It is difficult, in a history so recent, to dissociate and to determine the relative importance of the different factors which have contributed to the remarkable progress of medicine by research during the past few decades in all countries, but particularly in the United States of America and in this country. The change has here been so remarkably rapid since 1913 that it would be natural to regard the creation of the Medical Research Fund and its enlightened application as the factors of chief importance. As Sir Edward Mellanby properly indicates, however, the change had begun even earlier in America, chiefly with the support of private generosity, and had there derived much of its stimulus from a yet earlier German tradition. One of the features of this recent development, as Sir Edward also points out, has been the active contribution to medicine coming from physiology and biochemistry and the growing influence of these sciences on practice. Before 1913, while pathology had tended to become

almost too subservient to the practical needs of the clinician, physiology and biochemistry were usually regarded as having little relation to clinical medicine. Here again, while the fact that Sir Walter Fletcher had himself done distinguished work in physiology and biochemistry cannot have been without influence on the development of a new relation in this country, a change in the same direction was in progress elsewhere during the same period. The matter of chief importance in any case is the new spirit in which medicine and the contributory sciences are now advancing in co-operation as a body of experimental science. The need for the advancement of medicine by research is winning general recognition and attracting generous support from private donors as well as from the State. It is certain that William Harvey, who first showed this way of advance, would rejoice to see the extent to which his famous injunction to his fellow-physicians is becoming effective.

TREATMENT OF ANTERIOR POLIOMYELITIS

The system of treatment of anterior poliomyelitis which has been elaborated by Miss Elizabeth Kenny in Australia has attracted a good deal of attention both in that country and in this. It is a matter for congratulation, therefore, that the London County Council has been able to give full facilities for a twelve-month trial of the method at Queen Mary's Hospital, Carshalton, and that this experiment has been watched by four orthopaedic surgeons and a neurologist, in addition to the hospital staff. The report which has just been issued (see page 852) fully justifies this extended trial. It shows that there is value in Miss Kenny's work and that she has called attention to the fact that, at all events in certain instances, treatment by splinting and other methods of fixation has tended to become too stereotyped; this has meant that treatment by muscular re-education has been too long delayed or used with insufficient attention to detail. On the other hand, there would seem to have been an undue optimism as to the results to be expected from her treatment on the part both of Miss Kenny and of Dr. F. H. Mills,[1] who accompanied her on her visit to this country. They also seem to have been too ready to condemn the so-called "orthodox" methods, particularly the use of splints and of surgical appliances. Perhaps the most important results of this investigation are two which have no direct connexion with Miss Kenny's work. The first is the great value of collecting cases of poliomyelitis at an early stage of the disease into the wards of a hospital in which they can be subjected to intensive treatment by a team in which medical, surgical, nursing, and physiotherapeutic services are included; and the second is that this can be done without any real risk of spreading infection in the hospital. These certainly indicate that special clinics in orthopaedic hospitals should receive these patients as soon as possible after the onset of the disease.

Miss Kenny has claimed that all patients with poliomyelitis treated by her from an early stage have recovered completely. Such a claim is definitely negatived by the cases included in this report, which show at the end of twelve months results varying between complete recovery and a complete absence of improvement—results which no doubt depend chiefly upon the nature and severity of the lesion in the spinal cord. In the early stages of the disease pain and muscular rigidity are often prominent symptoms. These have usually been ascribed to irritation in the spinal cord and treated by complete rest. Dr. Mills[2] claims that they are vascular in origin and due to venous engorgement. He states that if the engorgement is allowed to persist it may result in trophic changes, but that it can be overcome in a few days by the use of fomentations, hydrotherapy, and passive movements. Unfortunately this sanguine view has not been confirmed. The report states that fomentations and hydrotherapy are of value but that the observations as to the relief of pain and rigidity by these methods are at present conclusive, and real progress in mobility is made only when the pain has disappeared. In some cases the pain has persisted for weeks or even months. Dr. Mills also states that a finely graded system of re-education must be started as early as possible, usually within the first week. It is difficult to discover upon what observations this is based. In the present series no case came under treatment earlier than the tenth day, and it does not appear that Dr. Mills has had the opportunity of treating many very early cases in Australia. Although these very early movements are considered to be harmless, their value is at present unproved.

With regard to splinting the report states that it is not possible to do without the use of splints and appliances in treatment, although under certain conditions such as treatment under close supervision in a special ward or hospital they can be dispensed with in the early stages of the disease. It does seem that in the hands of some practitioners the use of splints, of plaster-of-Paris, and of surgical appliances has become a routine; they have been employed unscientifically and sometimes for an unnecessarily long period, with a consequent neglect of movements and re-education. This is certainly

[1] *British Medical Journal*, 1937, **2**, 414; 1938, **1**, 168.

[2] *British Medical Journal*, 1938, **1**, 168.

to be condemned, and Miss Kenny has done a valuable piece of work in calling attention to it. Finally, in spite of Miss Kenny's optimism, it is to be feared that in the more severe cases, whatever the treatment, there will often be a residual paralysis, requiring the assistance of an appliance or of orthopaedic surgery.

SCIENCE IN ADVERTISING

As in the case of so many other purposive activities, advertising is these days often dignified by the title of "science." Advertising has its own technical language, and it employs statistics and charts and graphs in its efforts to discover the laws governing the purchasing idiosyncrasies of the public. The advertiser—or shall we say advertising specialist?—applies with some effect common-sense psychology in his efforts to induce the public to buy, for example, a certain brand of cigarette. If a well-known actor declares from the advertisement pages of a newspaper that such and such a cigarette does not irritate the throat, then members of a local dramatic society will feel that they can safely follow his example; and others will feel at least that they are smoking this brand in good company. This is perhaps an example of "snob appeal" combined with "prestige appeal." The vendors of patent medicines will crudely work upon the reader's fears. Manufacturers who want to "put across" foods and drinks, normal or "invalid," will, by implication, suggest that the substance to be consumed has almost magical powers. One of the latest developments in the science of advertising is to write advertisement copy in the language of the accepted sciences. Just as toys are now described as "educational playthings" so are simple saline purgatives placed before the public with short and learnedly sounding notes on acid-alkali balance. And if there is one thing the public is really afraid of it is acid. Now that we are all urged to drink more milk the makers of numerous varieties of milk products—so their advertisements imply—are getting really worried about the possible dangers to anyone going to sleep with milk-curds in the stomach. From this it is but a short step to the suggestion that a certain milk product will in itself induce sleep, and even give a better kind of sleep than one would get otherwise. In an advertisement which has recently come to our notice the doctor is boldly brought in on the side of the manufacturer of the product advertised. The public is informed that in a "great London hospital" special investigations are being carried out on fatigue, and that this was related to an excess of "acid waste products." So far, so good. The remarkable discovery is then announced that product X was the only one among many other drinks that neutralized the "acid wastes." To make assurance doubly sure that this was really all very scientific the advertisers appended a note which invited "doctors who would like to read the full scientific report of these experiments . . . to write for the monograph entitled" so and so. The text of this "monograph" covers two pages of an eight-page pamphlet. The observations briefly and dogmatically set down in this "monograph" are either accurate or inaccurate. If the former, then they would be of some considerable interest to medical men. The firm in question was asked by a physician for further information so that contact might be made with the hospital and the research workers engaged in the investigation. This was not forthcoming. Is the apparent endorsement by medical men of the claim set forth in the advertisement put in to persuade the public of the truth of these claims? And if these claims are true, then why this reluctance to disclose the identity of the "doctors and scientists engaged on a special series of experiments in a great London hospital"? Medical men must view with some alarm the possibility of the profession thus being used in an advertising campaign.

SEQUELS OF BLOOD TRANSFUSION

The great increase in the use of blood transfusion in medicine during the past ten or fifteen years has naturally led to the recognition of sequels which may be serious or fatal. Cases have been recorded in which syphilis and malaria have been conveyed by this means, while the symptoms of transfusion with incompatible blood are now comparatively well recognized; they include rigors, fever, dyspnoea, vomiting, muscular pains, haemoglobinuria, and jaundice. In patients with blood disease predisposing to retinal haemorrhage this, too, may occur as a sequel to transfusion. Renal insufficiency following blood transfusion has recently been studied by De Gowin, Warner, and Randall,[1] who point out that urinary excretion may be immediately diminished or suppressed, resulting in nitrogen retention, vomiting, and death from uraemia. Attempts have been made to explain the renal lesions as due to (1) mechanical blockage of the renal tubules by the precipitation of haemoglobin in contact with an acid urine; (2) anaphylaxis; (3) hypochloraemia consequent on the vomiting; or (4) the release of a nephrotoxic substance from the haemolysis of blood. The authors have considered the first of these theories in the light of histological examination of the kidneys of nine human subjects dying after transfusion or haemolysis, and of experimental material obtained from nine dogs transfused with haemolysed canine erythrocytes, in which the chemical and clinical findings pointed to death from renal insufficiency. In six of the dogs there was good evidence of obstruction by pigment of the tubules in the region of Henle's loops, and a minimal amount of necrosis. In three there was severe tubular necrosis in addition to obstruction, one dog showing also hepatic necrosis. The authors found that death resulted from renal insufficiency only when the urine was acid. From the human material they obtained evidence of the same two independent mechanisms—namely, obstruction by pigment and necrosis. The authors suggest that the obstructive factor might be eliminated by alkalinizing the urine before transfusion, but consider that renal insufficiency in the majority of human subjects is due to the release of a nephrotoxic factor. De Gowin[2]

[1] *Arch. intern. Med.*, 1938, **61**, 609.
[2] *Ann. intern. Med.*, 1938, **11**, 1777.

points out the importance of using typing sera of high titre, and quotes examples of donors at first classified as of Group O but found on retyping to be of Group A; the importance of cross-matching in each instance is also emphasized. He reports seven deaths occurring in 3,500 transfusions, five due to renal insufficiency and two to pulmonary oedema. The latter complication was found not to be due to the use of incompatible blood but more probably to overburdening the right heart.

SANITY AT GENEVA

In the midst of so much international strife it is reassuring to hear of international action directed to such sane and dignified ends as health, nutrition, housing, and the raising of the standard of life of the peasantry. Reports on all these subjects were presented to the recent Assembly of the League of Nations at Geneva and carefully considered in spite of preoccupation with the European crisis. The Health Organization reported on the technical assistance it has rendered to China. This has taken the form of three missions, under the direction of specialists, to aid in anti-epidemic measures. The missions, which include both Chinese and foreign staffs, have already under conditions of great difficulty had to combat outbreaks of plague, typhus fever, smallpox, cholera, and dysentery. During the summer the Chinese Government appealed to the Health Organization for a considerable supply of anti-cholera vaccine. Thanks to disinterested support by institutes and laboratories all over the world it was possible to arrange for the free supply of eight million doses of vaccine; and there were yet further offers—in fact, greatly in excess of demand. Special mention was made of the generous contribution of the United States, which gave three million doses, and of Rumania and Turkey, which each supplied one million. The Health Organization has also done signal service to countries in which malaria is prevalent by perfecting an anti-malaria remedy made from quinine substitutes which are much cheaper than quinine itself. Many public health administrations are unable to organize anti-malaria campaigns by quinine treatment on a sufficiently large scale because of the high cost of the drug. The recent issue of an analytical study embodying the Organization's views upon malaria control by treatment of malaria-infected populations is the result of extensive and carefully correlated experimental investigations—conducted over more than a year in five countries in Europe and Asia—into the comparative values of anti-malaria remedies. The important work of the League in the field of nutrition has been developed and extended. The technical commission on this subject is continuing systematically to carry out a scheme of research which is gradually throwing light both on the essential function of various nutritional constituents in body building and maintenance and on the actual conditions of nutrition among certain representative population groups in a number of countries. The commission is at present conducting an inquiry in Europe into the manner in which cereals are consumed, and especially into the composition of bread, as the nutritive value of these foods differs considerably according to the mode of preparation or to varieties within a given cereal species, and the results of inquiries into consumption might be distorted if these details were not obtained. In July of next year there is to be held a European Conference on Rural Life, and a preparatory committee has been at work at Geneva preparing the agenda. The conference is intended as a starting-point for systematic action by the public authorities in the direction of initiating, supporting, and accelerating the material and moral reconstruction of the conditions of life of the rural masses. It was pointed out by the rapporteur, the Yugoslav delegate, that the raising of the standard of living of the peasantry in matters of education, health, and rural planning is of vital interest to all countries in Europe, even the most highly industrialized and advanced. The documentary material prepared for the conference includes a memorandum on social insurance medical services by the International Labour Office and memorandums on health in rural districts and on medico-social policy, with special reference to tuberculosis, typhoid, and brucelloses, by the Health Organization.

THE SMALL HOUSE

Housing, in all its aspects, has long been recognized as a matter of medical concern. Domestic architecture is a phrase more often applied to the "stately homes of England," but England, after all, is in the main a country of small houses, and the Royal Institute of British Architects, in staging a "small house" exhibition at its headquarters in Portland Place, does good work in drawing attention to the value of the services of the architect even in the six-roomed dwelling. Photographs and drawings point the moral of good and bad estate development. Examples of bad development, anonymous in this exhibition, are found without difficulty, and some of the pleasantest situations in the southern counties have been spoiled by "bungaloid" growths, like a skin infection on the face of the country. But it must also be said that around London, to go no further afield, there are many examples of excellent estate development, by private enterprise too, and no wholesale condemnation can be made of the two million small houses which have been built in this country during the last ten years. The motive of the exhibition is to plead for a return to good homely domestic building, with houses arranged in harmonious groups in town and village. Equally useful is the insistence on hygienic construction in the small house itself, and this is what particularly interests the medical profession. The very fact that space and materials are restricted makes it all the more important that windows should be large, that the disposition of the living-rooms should have regard to the morning and afternoon sun, that the heating should be efficient, and that the kitchen should be well planned. All these conditions can be met by the exercise of careful choice and good craftsmanship and materials. The work of the architect is not simply to design a pleasing exterior. It includes, before the design is made, the choice of site, and afterwards it brings in all the various modifications and compromises which reconcile the physical conditions available with

the material and spiritual needs of those whose dwelling it is to be. Perhaps the wisest word on this as on many subjects was said by Bacon: "Houses are built to live in, not to look upon; therefore let use be preferred before uniformity, except where both may be had."

A SEASONABLE SERVICE

We publish this week once again a letter from Sir Thomas Barlow, as President of the Royal Medical Benevolent Fund, appealing for contributions towards the Christmas gift fund. The plan, now nearly thirty years old, is to send at Christmas time a small present of money, with a friendly message of remembrance and encouragement; but to give even 30s. to each of the regular beneficiaries will need at least £1,000. The response to Sir Thomas Barlow's annual appeal has proved, if any proof were needed, that there is no lack of warm hearts in the world of medicine. Those who for the first time contribute to the Christmas gift fund will, it is hoped, become regular supporters of the R.M.B.F. A perpetual flow of new subscribers is needed to fill gaps in the ranks and to keep up with the ever-growing demands on the resources of this great professional charity.

PAINTINGS BY DOCTORS

The exhibition by members of the Medical Art Society, now open at the Rembrandt Gallery, London, is well "worth a short detour" into Vigo Street. It comprises thirty-eight oil paintings, fifty-four drawings, mostly in water-colour, two aquatints, one etching, and four pieces of sculpture—giving an appropriate medical total of ninety-nine. The first impression is that the society has put plenty of colour and feeling on to the walls of the two rooms. Some of the exhibits are rather weak, but here and there works of real competence stand out—pictures that would do credit to any whole-time artist if shown in a general exhibition of contemporary art. Most of the drawings and paintings have been made on holiday; landscapes, seascapes, views of river or lake, and street scenes form the bulk of the pictures, but there are also indoor flower pieces, still-life studies and faithful drawings of flowers, and three or four interesting portraits. A love of Nature and keen powers of observation are evident everywhere, and many of the exhibits give proof of sound draughtsmanship and composition and the clean use of colour. It is not at all remarkable that doctors should enjoy sketching in their off time; the remarkable thing is that they should master the hard grammar of art and then achieve freshness and an air of spontaneity when recording their visual impressions on paper or canvas. There is an entertaining diversity of manner and method among the works shown, which range from elaborately planned and finished water-colours to dashing attempts to hold a glimpse with a few flicks of the brush, and between them a number of carefully wrought studies in one or other of the modern moods and techniques.

THORACIC SURGERY AT NEWCASTLE

The Newcastle General Hospital is one of the first hospitals in the provinces to have established a special department for all types of thoracic surgery. Mr. George Mason, who is in charge of the department, for the creation of which he was largely responsible, was the first surgeon in this country to carry out pneumonectomy and, after its originator, the first to perform O'Shaughnessy's operation for cardiac ischaemia. He has issued a report[1] on the work of his department from its inception on an experimental basis in December, 1934, until the end of 1936. Altogether 340 operations were performed on 174 patients. Seventy-three of the patients were referred by some local authority other than that of Newcastle-upon-Tyne. Of the 174 patients fifty were suffering from pleural or pulmonary tuberculosis; sixty-seven from inflammatory conditions of the lungs, such as abscess, gangrene, pneumonitis, infected lung cysts, and bronchiectasis; twenty-seven from other inflammatory conditions of the pleura, chest wall, and subdiaphragmatic spaces; and there were twelve cases of malignant disease of the lungs and bronchi, four of mediastinal growths and abscesses, seven of oesophageal obstruction, and seven of diseases of the heart and vessels. The report gives a good detailed account of the scope of thoracic surgery in language that will be intelligible to the layman. This is particularly useful at a time when more and more local authorities are being asked to provide facilities for thoracic surgery. Mr. Mason also discusses the training of the thoracic surgeon in relation to voluntary and municipal hospitals, and its influence on the provision of special departments. There is an appendix to the report showing radiographs illustrating the treatment of six widely different types of thoracic disease: thoracoplasty for pulmonary tuberculosis, the drainage of an enormous lung abscess, lobectomy for bronchiectasis, removal of a congenital lung cyst, the drainage of a mediastinal abscess, and the removal of a dermoid tumour of the mediastinum.

At the eleventh meeting of the International Congress of Surgery at Brussels last month Sir D'Arcy Power, K.B.E., was elected President of Honour of the International Society of Surgery. He was one of the founders of the society and was for many years the honorary local secretary for Great Britain and Ireland.

[1] Report on the Work of the Department of Thoracic Surgery during the Years 1934–36. City and County of Newcastle-upon-Tyne. Newcastle General Hospital.

The inauguration of the Ophthalmological Society of Australia (B.M.A.) was announced in our issue of July 30. Information has now been received that the first annual meeting will be held on April 3–6, 1939, at Melbourne. Ophthalmologists who are members of the British Medical Association are specially invited to attend. Communications should be addressed to the honorary secretary, Dr. Darcy Williams, 193, Macquarie Street, Sydney, N.S.W. This meeting coincides with the twelfth annual general meeting of the Royal Australasian College of Surgeons, which will discuss peptic ulcer, hydronephrosis, the common bile duct, and fracture of the neck of the femur.

SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

SULPHONAMIDE CHEMOTHERAPY IN SURGICAL INFECTIONS—I

BY

A. J. COKKINIS, M.B., B.S., F.R.C.S.

Sulphonamide chemotherapy is not a "surgical procedure," but is now being applied to surgical infections. So much has been written upon the subject of the "new chemotherapy" and it is still so "new" that it is impossible to dogmatize about it. It is possible, however, to present briefly the impressions gained from my own experience of some fifteen hundred cases.

Successful application of the new treatment is not easy, and haphazard administration on the "hit or miss principle" is worse than useless. Indeed the more one sees of it the more one is led to regard it as a double-edged weapon, capable of doing great good, but also of inflicting serious damage, not all of which is attributable to the toxic properties of these compounds. These drugs cannot of themselves "cure" any bacterial infection. Their sole action is, under favourable circumstances, to produce a condition of bacteriostasis (arrest of bacterial growth) that lasts no longer than the period during which they are administered. The ultimate result of an infection, therefore, still depends on the immunity reaction of the patient, and unless this can dispose of the organisms temporarily arrested by the chemotherapy either the treatment will prove a failure or a relapse of the infection will occur when it is discontinued. Furthermore, by their very ability to arrest bacterial growth these compounds, if given before immunity has had time to develop, may actually inhibit the anti-bacterial response of the body, thus leaving the patient with a "latent" infection but without the means to combat it or to deal with the "flare-up" which may occur when the treatment is stopped. In my belief this potential and as yet largely unrecognized danger of the new chemotherapy far outweighs the risk of damage by the toxic properties of the drugs. If this danger is to be avoided, and if optimum effects are to be obtained from the chemotherapy, the latter must be "timed" so as to coincide with the development of a fair degree of immunity. Moreover, it has been repeatedly shown that far better end-results are obtained from chemotherapy combined with immunotherapy (for example, vaccines) than from chemotherapy alone.

Selectivity of Action

The anti-bacterial action of sulphonamide compounds is highly selective. Only certain bacteria are susceptible, and it is therefore irrational to treat an infection with such compounds unless it is known in advance that one of these bacteria is responsible. Even susceptible bacteria respond differently to the treatment: some can be inhibited by small doses over a short period, others require larger dosage and a longer administration. Moreover, the response of any one organism is inconstant, some strains being more susceptible than others, and even the susceptibility of an individual strain in the same patient sometimes seems to vary from time to time. Other factors apart from variations in immunity and bacterial sensitivity influence the response to sulphonamide chemotherapy. Thus to obtain optimum results it is necessary to maintain the concentration of these compounds in the body at an effectively bacteriostatic level throughout their administration. The more potent of these compounds are very diffusible, and are excreted almost as rapidly as they are absorbed. To maintain an effective concentration they must therefore be given in adequate doses, properly "spaced," and the administration must be uninterrupted. Inadequate dosage and too short a period not only fail to do any good but seem to lead to the development of acquired resistance on the part of the organism to the drug ("sulphonamide-fastness"), which may produce complete non-response to subsequent chemotherapy, however intensive this may be.

To attack a bacterial focus the sulphonamide must be brought to it by the blood stream: an adequate blood supply to an infected area is therefore essential to success. I have seen many failures of chemotherapy attributable to the presence of avascular foci, such as infected blood-clot (for example, in thrombosed veins and cardiac vegetations), patches of necrotic tissue, abscesses embedded in fibrous tissue or sclerosed bone, and infected areas with local vascular failure following venous stagnation, thrombosis, or pressure by an inflammatory exudate. In some of these cases success was ultimately obtained by improving the blood supply of the focus with such measures as physiotherapy or surgical relief of tension. Finally, no chemotherapeutic agent can deal with an infection from an unlimited source of bacterial contamination, however sensitive the bacteria may be. Thus, it is futile to treat a general peritonitis with sulphonamide when there is a source of continuous infection, such as a perforated appendix or strangulated loop of intestine, unless this has been previously removed.

The number of bacteria now known to be sensitive to sulphonamide compounds already includes the following: haemolytic streptococci, certain non-haemolytic streptococci (for example, *Strep. viridans* and *Strep. faecalis*), *B. coli* and other members of the coliform group, certain pneumococci, the gonococcus, the meningococcus, and probably certain anaerobes, such as *Cl. welchii*.

Sulphonamide Compounds and their Nomenclature

Thus far I have made a trial of eight sulphonamide-containing substances. Although these do not constitute all the sulphonamide compounds manufactured to date, they are the best known and most thoroughly investigated of them. Much uncertainty exists in the minds of practitioners as to the nature of these compounds, partly on account of their complicated chemical structure but also because of the confusing and unnecessarily involved nomenclature adopted by manufacturers. The essential chemistry of these compounds is not difficult to understand. They all contain at least one benzene group (C_6H_6, shown usually in the form of the benzene ring), at least one amino group (NH_2), and at least one sulphonamide group (NH_2SO_2). If we start with benzene and add an amino (NH_2) group to it we obtain aminobenzene ( ), which is the chemical name for aniline. By attaching a sulphonamide group (NH_2SO_2) to the side (para) of aminobenzene, we obtain para-aminobenzenesulphonamide (NH_2SO_2). A shorter name for this is obviously aniline sulphonamide, which has been further abbreviated

to "sulphanilamide"—and so we arrive at the simplest and best known of all sulphonamide compounds. The other compounds are either modifications of sulphanilamide or substances with a more complicated chemical structure, but they all contain the above three groups.

Sulphanilamide (para-aminobenzenesulphonamide).—This is the compound which until quite recently has shown the greatest bacteriostatic potency and the widest anti-bacterial range. It is mostly manufactured in the form of oral tablets (7½ grains or 0.5 gramme), but unfortunately under so many different trade names that much confusion has arisen over its nomenclature. "Sulphanilamide" and "para-aminobenzenesulphonamide" are the only chemically correct names for it, but it is sold by various British and foreign firms under the following synonyms: sulphonamide-P, streptocide, prontosil album, colsulanyde, P.A.B.S., and prontylin. All these names refer to the same drug—sulphanilamide. An extremely diffusible substance, it is rapidly excreted in the urine, in which it can be estimated by a simple quantitative test. Sulphanilamide arrests the growth of all sulphonamide-susceptible organisms with the exception of the pneumococcus, but it is apt to cause certain toxic effects. Its effective dosage and period of administration vary with the causative organism, the weight of the patient, the site and nature of the infection, and the degree of immunity. Sulphanilamide has the advantage of being very considerably cheaper than most of the other sulphonamide compounds.

T 693.—Recently a compound of sulphanilamide and pyridine (para-aminobenzenesulphonamido-pyridine) has been introduced by Messrs. May and Baker (at present known as T 693), which shows a bacteriostatic potency at least equal to that of sulphanilamide and a wider anti-bacterial range, since it acts on pneumococci as well as on the other susceptible organisms. Unfortunately, in my hands it has proved even more toxic than sulphanilamide.

The Prontosil Drugs.—Prontosil rubrum (oral tablets) and prontosil soluble (by injection) are the original compounds (Bayer) with which the new chemotherapy started. They are highly complicated chemical substances, their full names being diamino-azo-benzol-sulphonamide (prontosil rubrum) and disodium-acetylamino-oxynaphthalene-disulphonate (prontosil soluble). Although their action is similar to that of sulphanilamide (into which they are partly converted in the body), their anti-bacterial range and potency are less extensive. But they have the advantage of being less toxic, and I have found prontosil soluble (in doses of 10 to 30 c.cm. of the 5 per cent. solution daily) particularly useful in major operation cases.

Proseptasine and Soluseptasine.—These drugs (May and Baker) are the least toxic of all the sulphonamide compounds. Unfortunately they also appear to be the least potent and to have the narrowest anti-bacterial range. Proseptasine (oral tablets) is a benzyl derivative of sulphanilamide (para-benzylaminobenzenesulphonamide), while soluseptasine (for injection) has a very complicated structure (disodium-phenylpropylaminobenzenesulphonamido-disulphonate) in some respects similar to that of prontosil soluble.

Uleron.—This compound (Bayer) is given in the form of oral tablets, and is much thought of in Germany; it differs from all the above in having two sulphonamide groups (disulphonamide). I have used it in some 200 cases of gonococcal, streptococcal, and coliform infections, and have found it relatively free from immediate toxic effects. Its anti-bacterial action, however, has proved very capricious, and one cannot help thinking that this may in part be due to its low solubility in neutral media, and probably, therefore, to its relatively poor diffusibility. Striking clinical improvements have followed its administration, but a rather low proportion of bacteriological cures.

Rubiazol.—At present I am making a trial of this compound (carboxy-sulphonamido-chrysoidine), made by Messrs. Roussel and extensively used in France. It appears to be relatively non-toxic, but I am not yet able to speak authoritatively of its anti-bacterial range or effectiveness.

Toxic Effects of the Compounds

On the whole it seems that the more effective a sulphonamide compound is against bacteria the more toxic it is to man. Thus, sulphanilamide and T 693, the two compounds which have shown the highest potency and widest anti-bacterial range, have also produced the highest incidence of toxic by-effects. These toxic effects may be divided into three groups, according to their severity and importance:

(*a*) *Mild*—of no significance, and not indicating cessation of the chemotherapy.—These are extremely common, and include headache, giddiness, muscular weakness, loss of energy, and other nervous symptoms; nausea, anorexia, and constipation; slight cyanosis, chilliness, palpitations, slight dyspnoea, and mild urticarial rashes. Fortunately, most of these symptoms tend to pass off after the first few days, owing to the development of tolerance to the drugs. Also, they can be mitigated to some extent by rest and fresh air, by cutting down the ingestion of sulphur, and by giving glucose and free fluids.

(*b*) *Moderate*—of no serious significance, but usually demanding cessation of the chemotherapy.—These occur in about 10 per cent. of patients taking sulphanilamide, and include vomiting, diarrhoea, prostration, mental changes, fever, extensive skin rashes (morbilliform and scarlatiniform), oedema, and marked cyanosis, pallor, or dyspnoea. The last three symptoms always indicate a complete examination of the blood.

(*c*) *Serious*—demanding immediate cessation of chemotherapy, repeated blood examinations, and appropriate therapeutic measures, which should include an attempt to get rid of any sulphonamide in the intestine by colonic wash-outs. The serious effects are: (i) destructive blood changes—for example, agranulocytosis and haemolytic anaemia; (ii) extensive purpuric rashes with high fever; (iii) toxic jaundice; (iv) toxic nephritis. In 1,500 cases I have seen only six examples of these serious effects, all of them recovering completely. I have yet to experience a case of agranulocytosis or other serious blood damage.

The other sulphonamide compounds have produced very little in the way of immediate toxic effects, but one of them—uleron—has the unique property of occasionally causing a peripheral neuritis. This does not occur unless the drug is given continuously over a period of more than seven days.

Gingivitis and Pyorrhoea

This disease is primarily a streptococcal gingivitis, and although there are many predisposing causes the teeth themselves may be quite sound. It starts with redness, swelling, and tenderness of the gums, which become spongy and bleed easily. The disease may be partly arrested at this stage, or it may pass on to suppuration and a genuine pyorrhoea. The infection of the gum becomes associated with a rarefying osteitis of the alveolus, leading to absorption of bone, and so to exposure, loosening, and finally casting off of the teeth. Conservative treatment, thus far, has been very unsatisfactory, as is shown

by the frequent use of such radical procedures as wholesale dental extraction and gingivectomy.

Some eight months ago, through the courtesy of Professor A. Fleming, a number of cases were investigated at St. Mary's Hospital in a research undertaken with Dr. C. W. Morley. It was found that the outstanding organisms were *viridans* streptococci, while haemolytic streptococci and other bacteria were less often discovered. We then started to treat cases with sulphonamide compounds, under full bacteriological control. We have succeeded, after many disappointments, in evolving a technique which yields a high proportion of excellent results, both clinically and bacteriologically, provided the cases are treated before there is loosening of the teeth or serious retraction of the gums.

Smears and cultures are taken at the start of treatment, and weekly afterwards. For the first two or three weeks the patient is given injections (twice weekly) of a parodental streptococcal vaccine, which are continued for a minimum of six weeks. Sulphonamide chemotherapy is started in the third or fourth week. Relapses are very common after only one course, and it was found that at least three 14 to 21 day courses had to be given (with intervals of two to four weeks) to obtain lasting improvement. Most of the cases have been given sulphanilamide (2 to 4 grammes daily), but we are now using T 693 with equally promising results. No local treatment is employed.

Ulcerative Stomatitis and Pharyngitis

During the work mentioned a number of cases were seen of chronic and relapsing septic ulcers of the mouth, palate, and pharynx, from which *viridans* or haemolytic streptococci were obtained on culture. They all responded to sulphonamide therapy clinically and bacteriologically in a matter of days, but most of them relapsed afterwards. We are now treating them along the same lines as the gingivitis cases—that is, with multiple courses of sulphanilamide and vaccine—and the good results appear to be much more lasting. Quite recently I obtained complete resolution in two days of a large acute streptococcal ulcer of the fauces with severe oedema. Sulphonamide chemotherapy would also seem to be worth trying in cancrum oris.

Acute Tonsillitis

My experience with sulphonamides in this condition is limited to cases of follicular (streptococcal) tonsillitis, Vincent's angina, and quinsy. The Vincent's angina cases failed to respond, but the follicular and suppurative tonsillitis resolved in twenty-four to forty-eight hours, although the actual follicles in follicular cases persisted for several days. Three of the follicular tonsillitis cases relapsed after only two days' treatment, and I now continue the chemotherapy for at least five days. All that the treatment seems to do in these acute cases is to hasten recovery, but one is perhaps justified in hoping that it may also prevent such complications as a septic adenitis or rheumatism. Quite moderate dosage of sulphanilamide (1.5 to 3 grammes daily) appears sufficient to overcome the infection, while the less toxic sulphonamides (for example, uleron or proseptasine) produce an equally striking, if a trifle slower, clinical improvement.

Sinusitis

Thus far I have treated three cases of chronic maxillary sinusitis and one of ethmoiditis with sulphonamides. Two of the maxillary cases were bilateral, of many years' standing, and had had several operations. Streptococci were obtained on culture, and both patients were ultimately made well, although one required no fewer than five courses of sulphanilamide and the other three courses. The third maxillary case, also very chronic, gave a growth of pneumococci as well as streptococci, and was treated with T 693 after preliminary vaccine. He improved rapidly, but was very intolerant to the drug; subsequently he was given two courses of sulphanilamide, and is now quite free from symptoms. The case of ethmoiditis (streptococcal) showed no response to a longish course of sulphanilamide, but there was extensive necrosis of the skull before the chemotherapy was begun.

The first three cases suggest that chemotherapy can influence even the chronic relapsing type of sinusitis. I do not know how long these patients will remain well, but I believe that repeated chemotherapy combined with vaccine will at least make relapses less frequent. As yet there has been no opportunity of treating primary acute sinusitis, but one has every reason to believe that it would respond more easily and more permanently than the chronic variety.

Otitis and Mastoiditis

Sulphonamide chemotherapy has already established itself as a valuable adjunct in the surgical treatment of these conditions; it has also proved of life-saving value in the streptococcal meningitis which may occur as a complication. But it cannot be stated too strongly that no anti-bacterial remedy should be used *as an alternative* to operative drainage of a suppurating focus in regions as dangerous as the tympanum and mastoid.

(*To be continued*)

THE PHYSICAL BASIS OF ALCOHOLIC MENTAL DISORDERS

LECTURE BY PROFESSOR MAPOTHER

The seventeenth Norman Kerr Memorial Lecture was delivered at Friends House, Euston Road, on October 11 by Professor Edward Mapother, professor of psychiatry, University of London. The chair was taken by Mr. Arthur Evans, F.R.C.S., president of the Society for the Study of Inebriety, under whose auspices the lecture is instituted.

Professor Mapother, discussing first of all the questionable results of alcohol, said that some findings appeared to support the conclusion that the expectation of life among insured persons was greater for abstainers than for even moderate drinkers. But it was uncertain how far this might be due to the fact that the so-called moderate was in reality immoderate at the time of insurance or became so subsequently. On the other hand, many of the most cherished beliefs of popular medicine as to the value of alcohol had gone, such as that, for instance, it kept out the cold, or formed a suitable ingredient of cooling drinks in summer. There seemed to be no foundation for the belief that it was indispensable to avert tropical infections or to ward off chill. The least justifiable of all kinds of drinking was drinking "by doctor's orders."

On the possible value of alcohol as a food, Sir Frederick Gowland Hopkins, as reported in the *British Medical Journal* of December 11, 1937 (p. 1184), had pointed out that experiment did not indicate that muscular exercise increased the rate of combustion of alcohol, which was the real issue. While alcohol was certainly destroyed

and oxidized in the blood, and thus produced heat, there was no proof that it entered into the metabolism of the muscles in the sense that sugar did. That, if a food at all, alcohol was a bad one could not be doubted.

Alleged Stimulating Effect of Alcohol

Turning to effects which beyond question did originate in the taking of alcohol to excess, Professor Mapother said that it was doubtful whether in man alcohol in any concentration ever really produced a true stimulation. In very low concentrations and in some persons relatively simple automatisms such as typewriting might show a minor degree of improvement, though even here it seemed likely that the apparent activation was in reality reduction of inhibition; but in all higher mental activities involving any degree of discrimination or any type of voluntary action, reduction of efficiency was universal, even with doses which were called moderate. To say that the effect of alcohol was reduction of inhibition was not necessarily to condemn its use in all circumstances. Alcohol, which was, of course, liable to lead to many accidents, also mitigated their shock; it was proverbial that drunken men might perform astonishing feats after sustaining a fracture. Alcohol had its use for operations before more effective anaesthetics were introduced; it not merely dulled the consciousness of the patient, but actually preserved him from the shock, which might have been fatal. None of these apparently beneficial effects constituted any sufficient justification for alcohol, because in every instance there were better ways of achieving the same end.

The initial taking of alcohol in the ordinary way was in the vast majority of cases for the production of pleasure. Addiction might arise by this becoming habitual, and then the motive became less clearly conscious. Later the person became conditioned so that for more and more situations having a few drinks was an automatic response. Even so far as "normal" people were concerned psychological explanations in many cases seemed inadequate, and a more likely theory was the periodic occurrence of a state of discomfort of biochemical origin which the individual had learnt could be allayed by alcohol.

"It is not uncommon in extremely able and well-balanced men living vigorous and useful lives to find that suddenly and out of the blue, without the least plausible explanation of a psychological kind, they are affected with a crisis of anxiety lasting several days. This may occur on the day after having dined not wisely but too well. And they are apt to correct it with a hair of the dog that bit them. The occurrence of a somewhat similar kind of crisis and the discovery of alcohol as the fatal antidote for this recurrent discomfort seems the most plausible explanation of the way in which many men, otherwise of the highest character and greatest efficiency, ruin their lives by a quite occasional bout of drunkenness."

The lecturer thought that this discomfort might be dependent upon the presence of adrenaline in excess, to which alcohol was antagonistic.

The Problem of Addiction

In discussing the addiction of those who eventually developed mental syndromes Professor Mapother distinguished between the cases in which the syndrome was an organic one due to alcohol and those in which it was not. There was little ground for belief in any quite specific craving for alcohol. Moreover, the strictly periodic dipsomania of which one read and heard from patients rarely stood examination. Among convalescent alcoholics while in hospital such crises of aggravated craving or anxiety as must then occur if they were true dipsomaniacs were practically never seen. Perhaps, as had recently been maintained, the periodic craving for alcohol was not a primary but a tertiary condition following upon occasional and then steady drinking.

Several physical explanations of acquired tolerance were conceivable. It might depend upon change in the permeability of the cell membranes and neurons; on a varying resistance of the barrier between the blood and the neuron; or upon the development in the blood of an antibody, biologically if not chemically forming an antidote to the action of alcohol. Actually the only demonstrable change was delayed absorption. The effect of alcohol on motor and still more on mental functions was variable, and the distinction between ordinary and pathological drunkenness entirely artificial. Somewhat less than 1 per cent. concentration in the blood was usually fatal. This concentration would be reached by the taking of one pint of absolute alcohol (for example, as two pints of whisky or brandy) within one or two hours.

Alcoholic Neuritis

Of the chronic effects of alcoholism the lecturer dealt in most detail with the nervous lesions of chronic neuritis; the lesions, by the way, in this condition were practically identical with the distribution of the nervous lesions in beriberi. In cases usually seen in this country it was notable that the distal parts of the legs were most affected. In a well-marked case there appeared to be a special affinity of the cause (whatever the cause was) for the lower sensory neurons. Thus appreciation as such of a painful stimulus—for example, a pin-point—was often lost before the awareness of a touch. Somewhat later than afferent changes, affection of the lower motor nerves of the anterior tibial group was usual, with characteristic foot-drop and "steppage" gait. On the other hand, that there might be affection of the lateral columns by chronic alcoholism was shown by the fact that before reflexes were abolished by impairment of proprioceptor or lower motor neurons there was often marked exaggeration of tendon jerks. This persisted throughout in many cases of Korsakow's psychosis without gross neuritis.

Of late years evidence had been steadily accumulating that the proximate cause of alcoholic neuritis was not the contact of the alcohol itself with the neurons. The action of the alcohol was indirect, bringing about shortages similar to those responsible for the nervous conditions in beriberi and other deficiency diseases. It had also been shown that if considerable doses of vitamin B_1 were given recovery from neuritis occurred, although the patient was still taking large amounts of whisky.

The lecturer went on to stress the frequency with which the syndromes which followed the damage done by alcoholism were combined or changed by transition into one another or alternated in different stages of one attack. This suggested that there was fundamental unity in their causation, and that their broader differences were probably anatomical and biochemical.

In alcoholic psychoses the predominant abnormalities were confusion, hallucinations, and amnesia for recent events. As a speculation it might be suggested that in all these conditions the system predominantly affected was a proprioceptor chain of which the lowest links were those neurons subserving sensation from muscles and joints. In Korsakow's psychosis the mood was often euphoric; in all the other syndromes there tended to be predominance of unpleasant feeling. It was a striking fact that in contrast with the euphoria for which drink was taken the mood of the psychosis resulting from chronic alcoholism was usually one of intense anxiety.

Professor Mapother concluded with some remarks on the social aspects of alcoholism, and ventured the opinion that in this country a larger measure of restriction would improve matters. Prohibition in the United States, although it broke down, largely owing to failure of co-operation between the authorities, lowered the incidence of alcoholic consequences to a level never previously approached. Prohibition might score even greater successes here, but it was not likely to come about, because of the respect for individual liberty which for good or ill was the chief contribution of this country to the world.

Nova et Vetera

THE ENGLAND OF LETTSOM

In his presidential address to the Medical Society of London on October 10 Dr. C. E. Lakin suggested that after the tension of recent weeks it might be a relief to turn the thoughts to the placid eighteenth century, the century in which the Society was founded, a period which had been regarded as the most serene and unimpassioned in the history of England. One looked back with longing, he said, to those days of quiet, when everything seemed to have settled down to a stable equilibrium—when the old man saw in his age the things he had seen in his youth. Under the spell of such recollections there seemed to be some excuse for regarding that century as a happier one than our own. How beautiful, for example, were the furniture and trinkets of the period! From these, as well as from the paintings and mezzotints, something of the spirit of the time could be caught. One compared them with our own mass-production to the disadvantage of the latter. In Georgian days the English landscape could be seen in all its beauty, and if a building was observed it enhanced the scene.

Dr. Lakin then proceeded to give an interesting illustrated account of the English countryside in the eighteenth century—its village life, its agriculture, economics, and transport. He also described the town, with its shops and streets, with the gibbets still standing in the Edgware Road, and the "resurrection men" still at work in a burying ground in Tottenham Court Road; also with coffee-houses, of which there were nearly 3,000 in Lo.. at the beginning of the eighteenth century. Child's coffee-house in St. Paul's Churchyard was, along with another in Cornhill, the favourite one for members of the College of Physicians, and there the physicians met the apothecaries. It was at a coffee-house that Radcliffe received the summons to hurry to St. James's to see Queen Anne, and sent a message that lost him his Court appointment, "Tell Queen Anne her distemper is nothing but vapours. She is in as good a state of health as any woman breathing, only she cannot make up her mind to believe it."

Harley Street in the Eighteenth Century

It was in the eighteenth century that Harley Street and the adjacent thoroughfares around Cavendish Square were built. Upper Wimpole Street, Devonshire Street and Place, and Beaumont Street occupied the site of the once famous Marylebone Gardens. Where Welbeck Street now stood there was an old inn where it was customary to examine pistols before setting off for the dangerous journey to Lisson Fields (now Lisson Grove), then a part of the village of Paddington. The pageant of the streets, Dr. Lakin continued, must have been made more vivid by the presence of medical students. Richard Smith, surgeon to Bristol Infirmary, had left a record of minute details of the dress and appearance of many of his medical contemporaries. He gave the following description of a fellow-student of his in the Borough, attending Guy's and St. Thomas's. His hair was pomatumed, powdered and frizzed, and tied behind in a tail. He had a large cravat with a muslin "cascade" in front, in which was a brooch. He wore a fancy figured short waistcoat, a pair of yellow breeches reaching halfway down his calf, blue silk stockings, and brass buckle shoes with false straps. A student in the Borough in 1765 on one occasion went to a confinement wearing a scarlet coat and carrying a sword. He was stopped by Dr. Colin Mackenzie, who pointed out to him the impropriety of a man going armed to bring a being into the world, the sword being generally used to send someone out of it.

Medical London of the Time

Concluding with some references to medical London in the second half of the eighteenth century, Dr. Lakin said that when William Hunter came to the metropolis in 1741 there were six hospitals. His own hospital—Middlesex—which Hunter joined in 1748, was launched by public subscription in 1745. Physicians abounded at that time, but only two surgeons of mark were alive. One was Cheselden, who was quite an old man, and the other was Percival Pott, who was in his prime. Physicians like Sir Hans Sloane were men of great learning, but more at home in literature and philosophical discussion than at the bedside. The greatest among the physicians was Mead, who was carried by a coach and six from his country to his town house. Scientific medicine might be said to date from 1761, a year which was memorable for the publication of two books, one of them Morgagni's great work which made pathological anatomy a science, and the other a work of Leopold Auenbrugger, on "A new device for detecting hidden diseases within the human chest by percussion to the thorax." Of Lettsom, the founder with Fothergill of the Medical Society of London, Dr. Lakin said that he was a man not greatly learned as learning counted in those times, but he was the impersonation of that valuable quality in a physician, common sense, and he had a heart of gold.

One hundred years ago George Owen Rees (1813-89) described the occurrence of hyperglycaemia in diabetes ("On Diabetic Blood," *Guy's Hospital Reports*, 1838). Though Matthew Dobson of Liverpool (1776) and the Italian chemist Ambrosiani (1835) had previously noted the presence of sugar in diabetic blood, its existence was doubted or ignored until Rees's demonstration. The first medical officer to Pentonville Prison, and lecturer on materia medica and physician at Guy's, Rees for many years was intimately associated with Alfred Swaine Taylor in some of the most celebrated criminal trials of the day. There is a comically grotesque drawing of Rees in *The Times Report of the Trial of William Palmer* (1856), and his portrait by Sidney Buck hangs in the Royal College of Physicians of London.

FORLANINI INSTITUTE: SCHOLARSHIP

The Privy Council announces that in connexion with the Carlo Forlanini Health Institute of Rome, a clinic for diseases of the respiratory system and tuberculosis, which organizes annually (from January to April) courses of training in phthisiology for foreign medical practitioners, the National Fascist Institute for Social Welfare offers to British medical practitioners:

1. A scholarship consisting of exemption from fees for registration and attendance at the course, free board and lodging at the Institute, and other facilities, including special railway facilities.

2. Three nominations entitling the holders to exemption from fees for registration and attendance at the training course, and other facilities, including special railway facilities.

Candidates must be qualified medical practitioners of at least three years' standing who have rendered effective service in specialized medical clinics or sanatoria or other scientific institutions for the treatment of tuberculosis. Any publications and attendance at other courses specializing in phthisiology can be considered as claims for preference.

With the concurrence of the Privy Council the British Medical Association has undertaken to receive applications from medical practitioners, who should communicate with the Secretary of the Association at B.M.A. House, Tavistock Square, London, W.C.1, not later than November 1, 1938, giving details of age, qualifications, and experience.

OPENING OF THE NEW SESSION

GUY'S HOSPITAL

SIR HENRY DALE ON THE FUTURE OF MEDICINE

The annual prize distribution and opening address at Guy's Hospital Medical and Dental Schools took place on October 14, and was presided over by Viscount Nuffield, treasurer of the hospital.

Sir Henry Dale, after distributing the awards to the medallists and prizemen, gave an address on "The Future of Medicine." He began with a few remarks about research, which, he said, had been his own job in life ever since qualification. There was one particular direction in which it seemed to him that the need for research ought to make a special claim on the men qualifying for medicine in this country and in other parts of the Empire. A vast area of the tropical regions of the world lay under British rule, and it could properly be urged that British medicine had a special responsibility with regard to the diseases which still continued in those regions to take a terrible toll of life and health. Here if anywhere in the medical field many nuggets of discovery still lay relatively near the surface, to be won by trained observation, in alliance with some of the courage, enterprise, and resourcefulness which took British explorers into those regions in times before our own.

Revolutionary Changes in Medicine

Coming to his main theme, Sir Henry Dale said that what he had chiefly in view was to attempt to form an idea of the nature and scope of some of the changes to be expected in the medicine which it would be the privilege of those he was addressing to apply. It seemed certain that the future would show an acceleration of the change, already in progress, by which the activities of the individual practitioner in preventive medicine were supplemented, supported, and to some extent directed by the organized use of medical knowledge on behalf of the community. The conception of preventive medicine itself would widen, with a growing recognition that the ultimate aim of medicine was not merely to relieve, to cure, or to prevent diseases which could be recognized and labelled, but to define and then to obtain, so far as insistence could do it, the conditions for a full and healthy development, and for continued health, for every member of the community.

This was a time of exciting and even revolutionary change and progress in which to enter medicine. The beginnings of the change were to be found some sixty or seventy years ago in the extraordinary outburst of activity in what were now called the medical sciences, such as bacteriology and physiology. Owing to this renaissance it would be found that medical knowledge had advanced and practice changed with it more in the past few decades than in several centuries preceding them. As an example he mentioned the tragedy of deaths from diphtheria at a time, in his own early experience, when the suspicion of faulty drains represented the highest flight of medical speculation concerning the aetiology of the disease. Nowadays, to take the Province of Ontario as an instance, the immunization of school children with toxoid had become so well established that a position was in sight in which diphtheria would have ceased to count as a threat to the child life of a progressive community. Was he wrong in foreseeing that an important part of the duty of medical men of the future would be to educate themselves and the public opinion which looked to them for guidance so as to ensure that the benefits of such saving knowledge were secured for those whose health would be in their care?

Again, in his student days a case of diabetes mellitus in the wards was viewed with despair by the physician. The discovery of insulin had changed that picture, but it had done much more than transform the treatment of diabetes: it had given an enormous impetus to researches on hormones in general. During the last twenty years active hormones had been obtained from the parathyroid glands, from the suprarenal cortex, from the different gonads, and, a whole series of them, from the pituitary anterior lobe. From liver and stomach mucosa materials had been extracted the administration of which restored to the victim of pernicious anaemia the factors missing from his blood-forming system. Insulin had been crystallized, thyroxine had been prepared by complete synthesis, while several of the sex hormones and that of the suprarenal cortex had been obtained as pure crystalline substances, structurally identified, and even prepared artificially by partial synthesis from different sterols. Twenty years ago it was held not to be certain that any of these substances had a real existence.

Further New Resources in Treatment

Recent progress in dietetics told a similar story. At the beginning of the century people talked about proteins, fats, and carbohydrates, and had some knowledge of the energy requirements of the body; but ignorance of qualitative dietetics was a reproach to medical science at that time, and medical advice on diet proved a fair target for the layman's humour. The change in recent years had been almost incredibly rapid. Twenty years ago it was possible to think of accessory factors as intangible traces of substances which might never be accessible to exact chemical study. Yet seven or more vitamins had now been separated in pure form, structurally identified, and prepared artificially by synthesis; and there were others, he believed, in near prospect.

All this illustrated the way in which research was providing new conceptions of aetiology and new resources for treatment based directly upon it. In his own student days one of his strongest impressions was the attitude of cynical scepticism then prevailing concerning the value of medicinal treatment. It was depressing to him at that time how seldom a prescription appeared to be written with any clear confidence in a real effect on the disease.

"Who would have ventured then to predict the day when it would become possible, by the use of natural remedies, to make a whole population resistant to diphtheria infection, or practically to abolish rickets in the children of a modern city, or to restore hormonal defects in the diabetic and the sufferer from pernicious anaemia, so as to enable them to live almost normal lives?"

The same kind of change was perceptible in the therapeutic use of artificial chemicals and substances unnatural to the body. Synthetic chemistry had done real service to medicine. He instanced prontosil and its active moiety sulphanilamide, and the brilliant new prospect thus opened of the successful treatment of conditions due to infections by streptococci, such as puerperal fever and erysipelas. Synthetic substances were coming to hand which dealt radically with the causes of disease, and not merely modified or moderated the resulting symptoms. This was a change only now becoming effective, and seemed to him certain to continue and to be more rapid in the future.

Sir Henry Dale concluded by affirming his faith that, with the disappearance of the earlier separation and critical rivalry between experimental research in laboratories on the one hand and empirical observation at the bedside on the other, and with the formation of a common front of advance in medical science, medicine would move towards the ideal of the creation and maintenance of the conditions of health, and not limit itself to the recognition and treatment of acute or obvious failures and anomalies.

"Sooner or later, in any case, the new weapons of science will come to your hands, and one of the most important developments which I hope that the future will see is the intelligent and enterprising use of the new knowledge by the man in ordinary practice, enabling him to retrieve, from the limbo of 'imaginary' ailments, many hormonal and dietary deficiencies, many chronic reactions to latent infection, and

many partial failures in factors of normal function yet unrecognized which future researches may reveal. If we can look forward to the time when the man in ordinary practice will be able to recognize, anticipate, and deal with the causes of vague and chronic ailments which bear no diagnostic labels and seldom reach the hospitals, then, indeed, I believe that the future of medicine is bright with the hope of better service to the health of mankind."

HAEMOLYTIC ANAEMIAS OF CHILDHOOD

LECTURE BY PROFESSOR L. G. PARSONS

The Schorstein Memorial Lecture was delivered on October 13 at the London Hospital Medical College by Professor Leonard G. Parsons. Dr. Robert Hutchison, P.R.C.P., presided. The lecturer took for his subject the haemolytic anaemias of childhood, on the basis of a study by himself and his colleagues of 120 cases.

It used to be stated, said Professor Parsons, that anaemias were divisible into primary and secondary. Such a classification existed for many years but was now obsolete, and it was clear that anaemia was much more a symptom than a disease. The attachment of personal names, whether Teutonic, or American, or even British, like those of Addison or Witts, to certain clinical syndromes was quite futile as a contribution to the classification of anaemias, however excusable on the ground of hero-worship.

Most classifications of anaemias divided them into those due to deficiency or inability to utilize material for the manufacture of red cells and those due to loss of blood; but it was possible for a given anaemia to fall under both heads. Continued loss of blood, as in excessive menstruation or bleeding piles, might lead to a depletion of the iron stores of the body, and unless this was made up by increased intake of iron iron-deficiency anaemia occurred.

The red cell passed through a series of changes from the reticulum in the marrow to the erythrocyte in the blood stream, and in the absence of certain materials in the bone-marrow a particular change might not take place. In the haemolytic group of anaemias reticulocytes formed a conspicuous feature of the blood film, not infrequently accompanied by an increase in the granular cells. The conception of the essential unity of the red cell in the blood stream and its precursors in the haematopoietic "factory" had been one of the great features of the haematological renaissance of the last decade. The word "haemolytic" was now so firmly engrafted in medical literature that it must be accepted, but in so doing Professor Parsons said that he was adopting the reprehensible practice of holding a candle to the devil.

Erythronic Response to Injury

The character of erythronic response was conditioned by (1) the part of the erythron most affected (meaning by erythron the tissue made up of circulating red blood cells and the cells from which they arose), as, for example, periphery or marrow; (2) the severity of the injury and the length of time for which it had lasted; (3) abnormalities of the erythron; and (4) abnormalities of the serum. As a result of the different varieties of erythronic response various forms of haemolytic anaemia were seen, of which he gave a list. Abnormalities of the erythron might give rise to acholuric jaundice, sicklaemia, Cooley's anaemia, or haemoglobinaemia. Abnormalities of the serum included haemolysins, alteration in blood lipoids, toxins of infection, and allergic states.

In discussing erythroblastosis the lecturer gave reasons which made him regard this condition as haemolytic. Erythroblasts occurred in foetal blood, and were therefore apt to occur in the newborn child. They were often found, indeed, in a normal full-term child, and sometimes to an extent which was almost pathological. Sepsis or syphilis might produce a picture identical with icterus gravis at any time during the first fortnight of life. The degree of erythroblastosis probably depended upon the degree of development of the extramedullary centres, and was in his opinion a response to haemolysis, and not a primary pathological condition.

Von Jaksch's Anaemia

Professor Parsons believed that many children said to be suffering from von Jaksch's anaemia were really victims of haemolytic anaemia. This condition, which usually occurred in a child under 3 years of age, was insidious in onset and the prognosis was good. There was usually at some time during the illness a leucocytosis. Von Jaksch did not give a very clear account of this anaemia. The syndrome occurred during the "deficiency age period" of a child's life—that is to say, the period when infantile scurvy or rickets was likely to occur. The von Jaksch picture might be found during the course of icterus gravis and in young children suffering from subacute haemolytic anaemia. He believed von Jaksch's anaemia—which was not an anaemia at all in the sense of a clinical entity—presented really the blood picture occurring in erythroblastic anaemia, probably only during the deficiency disease age period. He quoted three cases of supposed von Jaksch's anaemia. In one the duration was four months, and it was significant that a cousin of the child had acholuric jaundice. The second case was of three weeks' duration, and this had been said to be, by another observer, an undifferentiated medullary reticulosis. In both these cases there was erythrophagocytosis. The third case was of two years' duration, with fibril formation, and was ascribed to aplastic marrow.

Sickle-cell and Cooley's Anaemias

Passing to more chronic forms, Professor Parsons discussed certain differences between acholuric jaundice and ordinary haemolytic anaemia. Sicklaemia occurred mainly in negroes; here many of the red cells were sickle- or crescent-shaped. The haemolytic nature of sickle-cell anaemia could not be denied. The bone changes in this condition were very marked and more frequent than in acholuric jaundice. Another interesting point in sickle-cell anaemia was that after puberty the spleen seemed to atrophy.

Cooley had described a form of anaemia which he called erythroblastic. It was almost entirely limited to children of Syrian, Italian, or Greek stock. When the disease was fully developed the changes in the bones of the skull and face produced a mongoloid appearance. The spleen was generally enlarged, and often the liver and lymph glands. In the long bones the cortex was thin and transparent and the medulla showed reticulation. He mentioned a case of a boy aged 4 shown by Smallwood and himself to the British Paediatric Association which had affinities to both sickle-cell and Cooley's anaemias. There were abnormal cells in the blood and characteristic bone changes. The parents denied any possible negro strain in the ancestry, but returned next day rather shamefacedly confessing that one of the child's grandparents was Scotch! An anthropologist who was consulted stated that the child was negroid in feature. A striking part of the case was the great increase of erythroblasts in the blood after splenectomy. The boy had never been jaundiced, although he was slightly yellow in colour. The case was probably one of chronic haemolytic anaemia forming a connecting link between sickle-cell and Cooley's anaemias and other chronic haemolytic anaemias.

The varieties of haemolytic anaemia and certain other allied conditions owed their clinical characters to the permutations and combinations of the response to an injury. Fresh combinations might be expected to occur from time to time, and it was improper to regard the different forms observed by different authors as hard-and-fast types.

OPENING OF THE NEW SESSION

GUY'S HOSPITAL

SIR HENRY DALE ON THE FUTURE OF MEDICINE

The annual prize distribution and opening address at Guy's Hospital Medical and Dental Schools took place on October 14, and was presided over by Viscount Nuffield, treasurer of the hospital.

Sir Henry Dale, after distributing the awards to the medallists and prizemen, gave an address on "The Future of Medicine." He began with a few remarks about research, which, he said, had been his own job in life ever since qualification. There was one particular direction in which it seemed to him that the need for research ought to make a special claim on the men qualifying for medicine in this country and in other parts of the Empire. A vast area of the tropical regions of the world lay under British rule, and it could properly be urged that British medicine had a special responsibility with regard to the diseases which still continued in those regions to take a terrible toll of life and health. Here if anywhere in the medical field many nuggets of discovery still lay relatively near the surface, to be won by trained observation, in alliance with some of the courage, enterprise, and resourcefulness which took British explorers into those regions in times before our own.

Revolutionary Changes in Medicine

Coming to his main theme, Sir Henry Dale said that what he had chiefly in view was to attempt to form an idea of the nature and scope of some of the changes to be expected in the medicine which it would be the privilege of those he was addressing to apply. It seemed certain that the future would show an acceleration of the change, already in progress, by which the activities of the individual practitioner in preventive medicine were supplemented, supported, and to some extent directed by the organized use of medical knowledge on behalf of the community. The conception of preventive medicine itself would widen, with a growing recognition that the ultimate aim of medicine was not merely to relieve, to cure, or to prevent diseases which could be recognized and labelled, but to define and then to obtain, so far as insistence could do it, the conditions for a full and healthy development, and for continued health, for every member of the community.

This was a time of exciting and even revolutionary change and progress in which to enter medicine. The beginnings of the change were to be found some sixty or seventy years ago in the extraordinary outburst of activity in what were now called the medical sciences, such as bacteriology and physiology. Owing to this renaissance it would be found that medical knowledge had advanced and practice changed with it more in the past few decades than in several centuries preceding them. As an example he mentioned the tragedy of deaths from diphtheria at a time, in his own early experience, when the suspicion of faulty drains represented the highest flight of medical speculation concerning the aetiology of the disease. Nowadays, to take the Province of Ontario as an instance, the immunization of school children with toxoid had become so well established that a position was in sight in which diphtheria would have ceased to count as a threat to the child life of a progressive community. Was he wrong in foreseeing that an important part of the duty of medical men of the future would be to educate themselves and the public opinion which looked to them for guidance so as to ensure that the benefits of such saving knowledge were secured for those whose health would be in their care?

Again, in his student days a case of diabetes mellitus in the wards was viewed with despair by the physician. The discovery of insulin had changed that picture, but it had done much more than transform the treatment of diabetes: it had given an enormous impetus to researches on hormones in general. During the last twenty years active hormones had been obtained from the parathyroid glands, from the suprarenal cortex, from the different gonads, and, a whole series of them, from the pituitary anterior lobe. From liver and stomach mucosa materials had been extracted the administration of which restored to the victim of pernicious anaemia the factors missing from his blood-forming system. Insulin had been crystallized, thyroxine had been prepared by complete synthesis, while several of the sex hormones and that of the suprarenal cortex had been obtained as pure crystalline substances, structurally identified, and even prepared artificially by partial synthesis from different sterols. Twenty years ago it was held not to be certain that any of these substances had a real existence.

Further New Resources in Treatment

Recent progress in dietetics told a similar story. At the beginning of the century people talked about proteins, fats, and carbohydrates, and had some knowledge of the energy requirements of the body; but ignorance of qualitative dietetics was a reproach to medical science at that time, and medical advice on diet proved a fair target for the layman's humour. The change in recent years had been almost incredibly rapid. Twenty years ago it was possible to think of accessory factors as intangible traces of substances which might never be accessible to exact chemical study. Yet seven or more vitamins had now been separated in pure form, structurally identified, and prepared artificially by synthesis; and there were others, he believed, in near prospect.

All this illustrated the way in which research was providing new conceptions of aetiology and new resources for treatment based directly upon it. In his own student days one of his strongest impressions was the attitude of cynical scepticism then prevailing concerning the value of medicinal treatment. It was depressing to him at that time how seldom a prescription appeared to be written with any clear confidence in a real effect on the disease.

"Who would have ventured then to predict the day when it would become possible, by the use of natural remedies, to make a whole population resistant to diphtheria infection, or practically to abolish rickets in the children of a modern city, or to restore hormonal defects in the diabetic and the sufferer from pernicious anaemia, so as to enable them to live almost normal lives?"

The same kind of change was perceptible in the therapeutic use of artificial chemicals and substances unnatural to the body. Synthetic chemistry had done real service to medicine. He instanced prontosil and its active moiety sulphanilamide, and the brilliant new prospect thus opened of the successful treatment of conditions due to infections by streptococci, such as puerperal fever and erysipelas. Synthetic substances were coming to hand which dealt radically with the causes of disease, and not merely modified or moderated the resulting symptoms. This was a change only now becoming effective, and seemed to him certain to continue and to be more rapid in the future.

Sir Henry Dale concluded by affirming his faith that, with the disappearance of the earlier separation and critical rivalry between experimental research in laboratories on the one hand and empirical observation at the bedside on the other, and with the formation of a common front of advance in medical science, medicine would move towards the ideal of the creation and maintenance of the conditions of health, and not limit itself to the recognition and treatment of acute or obvious failures and anomalies.

"Sooner or later, in any case, the new weapons of science will come to your hands, and one of the most important developments which I hope that the future will see is the intelligent and enterprising use of the new knowledge by the man in ordinary practice, enabling him to retrieve, from the limbo of 'imaginary' ailments, many hormonal and dietary deficiencies, many chronic reactions to latent infection, and

many partial failures in factors of normal function yet unrecognized which future researches may reveal. If we can look forward to the time when the man in ordinary practice will be able to recognize, anticipate, and deal with the causes of vague and chronic ailments which bear no diagnostic labels and seldom reach the hospitals, then, indeed, I believe that the future of medicine is bright with the hope of better service to the health of mankind."

HAEMOLYTIC ANAEMIAS OF CHILDHOOD

LECTURE BY PROFESSOR L. G. PARSONS

The Schorstein Memorial Lecture was delivered on October 13 at the London Hospital Medical College by Professor Leonard G. Parsons. Dr. Robert Hutchison, P.R.C.P., presided. The lecturer took for his subject the haemolytic anaemias of childhood, on the basis of a study by himself and his colleagues of 120 cases.

It used to be stated, said Professor Parsons, that anaemias were divisible into primary and secondary. Such a classification existed for many years but was now obsolete, and it was clear that anaemia was much more a symptom than a disease. The attachment of personal names, whether Teutonic, or American, or even British, like those of Addison or Witts, to certain clinical syndromes was quite futile as a contribution to the classification of anaemias, however excusable on the ground of hero-worship.

Most classifications of anaemias divided them into those due to deficiency or inability to utilize material for the manufacture of red cells and those due to loss of blood; but it was possible for a given anaemia to fall under both heads. Continued loss of blood, as in excessive menstruation or bleeding piles, might lead to a depletion of the iron stores of the body, and unless this was made up by increased intake of iron iron-deficiency anaemia occurred.

The red cell passed through a series of changes from the reticulum in the marrow to the erythrocyte in the blood stream, and in the absence of certain materials in the bone-marrow a particular change might not take place. In the haemolytic group of anaemias reticulocytes formed a conspicuous feature of the blood film, not infrequently accompanied by an increase in the granular cells. The conception of the essential unity of the red cell in the blood stream and its precursors in the haematopoietic "factory" had been one of the great features of the haematological renaissance of the last decade. The word "haemolytic" was now so firmly engrafted in medical literature that it must be accepted, but in so doing Professor Parsons said that he was adopting the reprehensible practice of holding a candle to the devil.

Erythronic Response to Injury

The character of erythronic response was conditioned by (1) the part of the erythron most affected (meaning by erythron the tissue made up of circulating red blood cells and the cells from which they arose), as, for example, periphery or marrow; (2) the severity of the injury and the length of time for which it had lasted; (3) abnormalities of the erythron; and (4) abnormalities of the serum. As a result of the different varieties of erythronic response various forms of haemolytic anaemia were seen, of which he gave a list. Abnormalities of the erythron might give rise to acholuric jaundice, sicklaemia, Cooley's anaemia, or haemoglobinaemia. Abnormalities of the serum included haemolysins, alteration in blood lipoids, toxins of infection, and allergic states.

In discussing erythroblastosis the lecturer gave reasons which made him regard this condition as haemolytic. Erythroblasts occurred in foetal blood, and were therefore apt to occur in the newborn child. They were often found, indeed, in a normal full-term child, and sometimes to an extent which was almost pathological. Sepsis or syphilis might produce a picture identical with icterus gravis at any time during the first fortnight of life. The degree of erythroblastosis probably depended upon the degree of development of the extramedullary centres, and was in his opinion a response to haemolysis, and not a primary pathological condition.

Von Jaksch's Anaemia

Professor Parsons believed that many children said to be suffering from von Jaksch's anaemia were really victims of haemolytic anaemia. This condition, which usually occurred in a child under 3 years of age, was insidious in onset and the prognosis was good. There was usually at some time during the illness a leucocytosis. Von Jaksch did not give a very clear account of this anaemia. The syndrome occurred during the "deficiency age period" of a child's life—that is to say, the period when infantile scurvy or rickets was likely to occur. The von Jaksch picture might be found during the course of icterus gravis and in young children suffering from subacute haemolytic anaemia. He believed von Jaksch's anaemia—which was not an anaemia at all in the sense of a clinical entity—presented really the blood picture occurring in erythroblastic anaemia, probably only during the deficiency disease age period. He quoted three cases of supposed von Jaksch's anaemia. In one the duration was four months, and it was significant that a cousin of the child had acholuric jaundice. The second case was of three weeks' duration, and this had been said to be, by another observer, an undifferentiated medullary reticulosis. In both these cases there was erythrophagocytosis. The third case was of two years' duration, with fibril formation, and was ascribed to aplastic marrow.

Sickle-cell and Cooley's Anaemias

Passing to more chronic forms, Professor Parsons discussed certain differences between acholuric jaundice and ordinary haemolytic anaemia. Sicklaemia occurred mainly in negroes; here many of the red cells were sickle- or crescent-shaped. The haemolytic nature of sickle-cell anaemia could not be denied. The bone changes in this condition were very marked and more frequent than in acholuric jaundice. Another interesting point in sickle-cell anaemia was that after puberty the spleen seemed to atrophy.

Cooley had described a form of anaemia which he called erythroblastic. It was almost entirely limited to children of Syrian, Italian, or Greek stock. When the disease was fully developed the changes in the bones of the skull and face produced a mongoloid appearance. The spleen was generally enlarged, and often the liver and lymph glands. In the long bones the cortex was thin and transparent and the medulla showed reticulation. He mentioned a case of a boy aged 4 shown by Smallwood and himself to the British Paediatric Association which had affinities to both sickle-cell and Cooley's anaemias. There were abnormal cells in the blood and characteristic bone changes. The parents denied any possible negro strain in the ancestry, but returned next day rather shamefacedly confessing that one of the child's grandparents was Scotch! An anthropologist who was consulted stated that the child was negroid in feature. A striking part of the case was the great increase of erythroblasts in the blood after splenectomy. The boy had never been jaundiced, although he was slightly yellow in colour. The case was probably one of chronic haemolytic anaemia forming a connecting link between sickle-cell and Cooley's anaemias and other chronic haemolytic anaemias.

The varieties of haemolytic anaemia and certain other allied conditions owed their clinical characters to the permutations and combinations of the response to an injury. Fresh combinations might be expected to occur from time to time, and it was improper to regard the different forms observed by different authors as hard-and-fast types.

INFANTILE PARALYSIS AND CEREBRAL DIPLEGIA CLINIC AT CARSHALTON

The following report has been received for publication from the London County Council.

Anterior poliomyelitis, commonly known as infantile paralysis, is a disease which causes permanent paralysis of one or more limbs in a large proportion of those affected. Of the physically defective children admitted to the special or hospital schools of the London County Council approximately sixty each year owe their disability to this disease. The arrival in England of Miss Elizabeth Kenny, who had done much work on infantile paralysis and allied crippling diseases in Australia, was therefore of great interest. The Council decided that her claims to be able to prevent permanent paralysis and to effect great improvement in these diseases should receive every opportunity for demonstration, and that the fullest scientific investigation should be made. With this end in view the Council agreed to afford Miss Kenny the necessary facilities, and an experimental unit was started at Queen Mary's Hospital for Children, Carshalton. In order to ensure proper assessment of the value of the treatment the Medical Officer of Health invited several prominent specialists in association with the medical staff of the hospital to observe and investigate it; their opinions are given in the subjoined report. Before leaving England in August, 1938, Miss Kenny wrote the following letter to the Clerk of the Council:

August 12, 1938.

Dear Sir,—On the eve of my departure for Australia I wish to place on record my appreciation of the action of the London County Council in affording me the necessary facilities to demonstrate my method of the treatment of infantile paralysis and spastic paralysis. Prior to my arrival in England no such trial had been arranged. I also appreciate very much the honour of the association in the work of the medical committee arranged by your Council. Also the Council's employees who were associated with me at Queen Mary's Hospital. My stay in this institution shall ever remain as one of the most pleasant experiences of my life.

Again thanking you very much.—Your sincerely,

(Signed) E. Kenny.

REPORT ON THE KENNY METHOD OF TREATMENT

The period of one year has expired since Miss Kenny, with the Council's sanction, began the demonstration of her methods of care and treatment of poliomyelitis and of cerebral spastic paralysis. The work started on July 13, 1937. A ward was evacuated, and was equipped as a clinic with the baths and other apparatus used by Miss Kenny and described in detail by her in her book, *Infantile Paralysis and Cerebral Diplegia* (Angus and Robertson, Sydney, Australia, 1937). Two adjoining wards (twenty-eight beds) and, later, a third ward (eighteen beds) accommodated the in-patients. There were also a small number of out-patients who have attended daily, every other day, or at such periods as were prescribed. The wards were staffed by members of the regular hospital nursing staff, whose numbers were somewhat increased beyond the hospital standard on account of the intensive care required day and night by Miss Kenny.

Miss Kenny brought with her two of her Australian trainees, who have assisted her continuously through the whole period, and to complete the staffing five of the whole-time trained massage staff (with the part-time services of the massage superintendent) were appointed to learn the details of Miss Kenny's methods and work under her direction. From November to April Miss Kenny herself had to return to Australia, and during this period she delegated the supervision of the treatment to Dr. F. H. Mills, M.B., B.S., Sydney, who is familiar with the system, and to her senior trainee (Miss Grant). In this way continuity was preserved. From the hospital side the whole unit was supervised by Mr. G. M. Gray, F.R.C.S., one of the Council's senior resident assistant medical officers, who has devoted his whole time to this work and to the careful observation of every one of the patients, as well as the detail of the treatment given.

In the first place the agreement with Miss Kenny was that her work should be demonstrated for three months, but at the end of that time it became obvious that this period was too short for any reliable opinion to be formed as to the results of her treatment and, accordingly, it was later agreed to extend the period to twelve months.

In view of the interest which has been aroused and the manifest importance of the whole matter the Medical Officer of Health of the Council invited the assistance of orthopaedic surgeons and neurologists to form an honorary advisory committee to watch the treatment carried on and to be associated with the Council's officers (Dr. H. O. West, M.D., F.R.C.P., D.P.H., medical superintendent of Queen Mary's Hospital, and Mr. G. M. Gray, M.A., M.B., Ch.B., F.R.C.S.Ed., F.R.C.S.Eng.) and the consulting orthopaedic surgeon to the hospital (Mr. C. Lambrinudi, F.R.C.S.) in their conclusions. There were accordingly appointed: Mr. H. A. T. Fairbank, D.S.O., O.B.E., M.S., F.R.C.S., Mr. R. C. Elmslie, O.B.E., M.S., F.R.C.S., Mr. E. I. Lloyd, M.A., M.B., Ch.B., F.R.C.S., Dr. Macdonald Critchley, M.D., F.R.C.P.

In accordance with Miss Kenny's request for the admission to Queen Mary's Hospital of cases of poliomyelitis in the early stage of the disease all such cases coming under the Council's care were admitted to this unit. In addition a number of cases of residual paralysis in poliomyelitis selected by Miss Kenny were transferred to her care, and also a few cases of cerebral spastic paralysis which she considered were suitable for the demonstration. In all, sixty-three patients have been treated, as follows:

Poliomyelitis:	
(*a*) Recent (treatment commencing less than 8 weeks from onset)	34
(*b*) Later (treatment commencing over 8 weeks and less than 12 months from onset)	12
(*c*) Residual (treatment commencing over 12 months from onset)	9
	55
Cerebral spastic paralysis	8
	63

In general Miss Kenny's treatment has not been interrupted or interfered with in any case except as the result of incidents (such as infectious diseases) which could not be controlled. Even in cases in which infectious diseases occurred interference was avoided as far as possible by one of the trainees going daily to the fever hospital, with the kind co-operation of the medical superintendent (Dr. J. S. Anderson, Grove Hospital).

Miss Kenny claimed in her book that she has obtained complete recovery in all recent cases of poliomyelitis which she has personally treated from the commencement.

> "*Infantile Paralysis.*—All recent cases treated at the clinic [Townsville] have been totally and permanently cured. . . . It must be acknowledged that the number of recent cases of infantile paralysis at that time was very few—in fact, four only. During the last two years this number has been increased to twelve, with the same happy results" (p. xxi—author's preface).

Herein lies the importance of the admission of early cases already alluded to. If we correctly understand from this that Miss Kenny claims to be able to cure poliomyelitis completely, then we are of the opinion, as the result of our observations during the past year, that such a claim is in no way substantiated.

Miss Kenny's Five Principles

There remain, therefore, the questions whether Miss Kenny's methods are better than customary methods, whether they yield better or more rapid results, and

whether they should be recommended for general adoption. These methods are enumerated as follows (ibid., p. 3): (1) maintenance of a bright mental outlook; (2) maintenance of impulse; (3) hydrotherapy and remedial exercises; (4) maintenance of circulation; (5) avoidance of the generally accepted methods of immobilization. These may now be considered seriatim.

1. *Maintenance of a Bright Mental Outlook.*—We certainly agree that an optimistic outlook should be adopted both by the patient and by those under whose care he is placed; but in a disease such as poliomyelitis this must be tempered by the judgment of clinical knowledge, otherwise it is liable to become mere deception.

2. *Maintenance of Impulse.*—We understand Miss Kenny to mean by this that the patient must be helped to make the mental effort to carry out a movement even when the muscles are so completely paralysed that no movement and no tightening of them can be perceived. We do not agree that any mental effort to produce muscular contraction can be felt by an attendant's hand unless contraction actually occurs. Miss Kenny's "impulse" is presumably a minimal contraction of the muscle, which may be so slight as to require experience in its detection. On the other hand we agree that the voluntary contraction of muscles that have been paralysed or weakened should be encouraged by every possible means. This is, of course, in accordance with generally accepted views.

3. *Hydrotherapy and Remedial Exercises.*—Miss Kenny's method of hydrotherapy is carried out in individual slipper baths or in a special "arm" bath. A warm bath is used, with a hot and cold douche as a method of stimulation, and in it the limbs are exercised. The principle of under-water exercises is not a new one, but in hospital practice it is more often carried out in communal baths. The use of alternating hot and cold douches appeals to us as useful. Miss Kenny sets out the merits of hydrotherapy: (i) the circulation in the limbs and skeletal muscles is improved; (ii) their nutrition is maintained; (iii) the buoyancy of the saline water assists weak movements; and (iv) hydrotherapy improves the mental outlook (ibid., p. 7). With this view we agree, and we think Miss Kenny's method is of value, but we cannot altogether accept her criticisms of the "communal bathing pool," which are as follows: (i) the proximity of other patients causes distraction; (ii) the effort to keep afloat causes lessening of mental concentration; (iii) it is impossible to obtain the same degree of co-operation between the patient and attendant that the individual bath affords; (iv) a newly acquired movement may not be perceived as soon as it may be by the method of the individual baths, and through this oversight may be overtaxed and so weakened; and (v) that hygiene is lacking (ibid., p. 7). All these objections can be overcome. Large baths are no doubt to some extent unhygienic, but their use is limited to patients in hospital, and frequent changing of the water and simple hygienic measures are universally practised. Actually we think there are certain objections to the small individual slipper baths: there is not room for certain movements—for example, abduction of the lower limbs—and the use of the principle of buoyancy is limited.

We must now refer to the important question of when remedial exercises (or muscle re-education) are to begin. Miss Kenny strenuously advocates muscle re-education as early as possible in the course of the disease, and is not unwilling to practise this even before the cessation of pain. Her method of re-education consists essentially of passive movements which the child is invited to assist, if possible, by voluntary contraction of the appropriate muscles. It might be expected that such early movements would eliminate the incidence of stiffness so often observed when immobilization by splinting has been unduly prolonged. But we have seen stiffness arising quite early when no splint has been used. It does seem that real progress in passive mobility is only made when the pain has disappeared. Miss Kenny claims that her method of hydrotherapy, fomentations, and passive movements helps to get rid of pain. Our observations upon this point are inconclusive, because the duration of pain in individual cases varies greatly.

4. *Maintenance of Circulation.*—Miss Kenny attaches great importance to this, and we think rightly so. Though it is a matter which is usually attended to with care in individual cases at home, it has to be admitted that it should receive more attention in hospital practice. Among the ill effects Miss Kenny ascribes to failure to maintain a good circulation are the following:

(i) *Loss of Muscle Tone.*—This is well known to the massage profession, whose members find that they cannot get the muscles active until the limb has been warmed up.

(ii) *Wasting.*—This depends mostly on the extent of the damage to the nerve cells, and the influence of peripheral circulatory factors is slight. In the cases under review there certainly is wasting, but there is no doubt that the texture of the skin and subcutaneous tissues is good.

(iii) *Chilblains.*—These also have not occurred, but we should say (*a*) that chilblains ought not to occur in such children who are in-patients in a hospital, and (*b*) that they are late manifestations and are not usual in the first year.

5. *Avoidance of the Generally Accepted Methods of Immobilization.*—In this principle Miss Kenny appears to differ fundamentally from what is described as the "orthodox" view. Dr. Mills, describing her method (*British Medical Journal*, 1938, **1**, 168), summarizes "orthodox" methods of treatment:

> "The accepted or orthodox methods of treatment may be summarized as follows: (*a*) rest and immobilization of the affected limbs until the stage of pain or irritation is past; (*b*) maintenance of affected muscles in a position of relaxation; (*c*) avoidance of contractures and deformities by light retentive apparatus; (*d*) massage and active and passive movements. Treatment along these lines is based upon the theory that the pain in the limbs is of central or meningeal origin. . . . In opposition to this accepted theory the view is taken that the pain in the extremities is almost completely vascular in origin."

While this summary may be generally accepted it is necessary to point out that "orthodoxy" is not a precise term. Indeed, it is well known that orthopaedic surgeons differ widely in the practical application of the principles of splinting and immobilization; so that when "immobilization" is spoken of and condemned by Miss Kenny as if it were the habit of all orthopaedic surgeons to place children on a retentive frame or in splints without any other treatment for an indefinite period of time, even extending to months, and the production of deformities is ascribed to the splints themselves, her view is inaccurate. While we should agree that "immobilization" may be practised over-long, we are opposed to Miss Kenny's refusal to use any splint at all in the treatment of this disease. All retentive splintage must be employed intelligently and with discretion as a means to an end and not merely as an end in itself. Miss Kenny claims that the initial period of rest and immobilization is unnecessary and adheres to the "theory of natural posture in correct alignment without immobilization," meaning thereby that the body and limbs should be kept in their natural position in the intervals between exercises. This she aims at maintaining by the constant attention of the trainees or nurses and by means of pads and slings and boards at the end of the bed to prevent "footdrop." She thus uses "position" but will not adopt the use of splints to maintain it.

Apart from some degree of contracture of the tendo Achillis in a few cases that was overcome later, we have seen the development of no contractures while the patients were recumbent and well supervised, nor have we found evidence that her refusal to put the paralysed muscles in the position of relaxation has caused delay in the initial return of power. We think, therefore, that it must be admitted that Miss Kenny's method of keeping limbs in a neutral position without splints when in bed is not harmful in the early stages of the disease, and in fact has this to commend it—that it spares the children the irksomeness of splints at that stage. On the other hand we are as definitely of the opinion that, when a muscle is recovering, splints are often useful in preventing over-fatigue and deformity. It follows from this that we think Miss Kenny's prejudice against splints and appliances leads her to keep the children recumbent unnecessarily long, when the judicious use of an appliance might enable them to get about earlier with no harm to the muscles and joints and even with benefit to the muscles and to the child generally.

It is certainly vital to Miss Kenny's system that there should be constant supervision. Such intensive care seems only possible in an institution specially equipped and staffed for the purpose.

Exercises and Other Procedures

With these five "principles" in view Miss Kenny uses "exercises and other procedures for the restoration of functional power to apparently paralysed muscles." It

is not, we think, necessary to describe in detail her methods of "muscle re-education." They are simple, and can be carried out by trainees who have not been as fully instructed in anatomy and physiology as are members of the massage profession. We have seen nothing to suggest that Miss Kenny has designed methods superior to those used by the massage profession. In fact, we consider it is legitimate criticism of her method that it does not include a number of useful measures practised, certainly in this country, by experienced masseuses. As we have already observed, Miss Kenny's system involves that such muscle re-education should be begun in the early stages and should be continued throughout the treatment, and she claims on its behalf that it maintains the dormant normal impulses which she believes wither under immobilization methods and may die beyond the hope of resuscitation. Careful graduation of exercise as practised by her avoids over-fatigue, and in this she follows well-established practice. Treatment by early movements, it must be noticed, is being practised in several other centres abroad. We have seen no evidence that the early movements in the cases we have observed have been harmful, but neither have we reason to think that they have specific value in determining the degree of restoration of useful function. This method has perhaps encouraging psychological effects which may be beneficial. It is noticeable that in some of the severe cases treated from an early stage all the efforts of Miss Kenny and her staff have failed to bring back any movement in the paralysed muscles.

Twelve months is too short a period in which to assess finally the question of residual paralysis. In our view Miss Kenny has not really faced this issue. If we understand her aright, she believes that, under her system, in two—or perhaps three—years' time her patients will not require artificial aids, and, having sufficient useful function, will not require any surgical supervision or after-care. We wish we could believe this to be true. It is of course well known that some patients with poliomyelitis recover to a considerable degree under any system of treatment and that they may continue slowly to improve for a long time, but so far as our twelve months' observation of this very interesting experimental period has gone we have seen nothing whatever to justify Miss Kenny's belief. We have been especially interested in her opinion, expressed late in the year, that she is satisfied if she can get partial recoveries—for example, in an arm case she aims at a "good forearm," and in a leg case at "good gluteal muscles," leaving stabilizing operations to the surgeon. This differs little from the accepted view in this country. In this she seems to abandon her claim to effect a complete cure.

It is necessary, we think, to refer only briefly to Miss Kenny's treatment of cases of cerebral spastic paralysis. By her extreme attention to detail, incessant and intensive application, coupled with most admirable patience and optimistic enthusiasm, Miss Kenny has achieved some amelioration in the cases under treatment. But there is nothing original in the principles of her treatment, and it is very doubtful whether any of the more severely affected patients treated can ever become self-supporting. In our experience of these cases improvement of some sort under any intensive system of training or treatment often occurs. No doubt this is encouraging to the relatives of these patients, but relapses are not infrequent following the cessation of treatment.

General Observations

We may conclude this report by some general observations. We have indicated our view that this system is not the last word in the treatment of poliomyelitis. (We disagree with Dr. Mills's enthusiastic support, and feel bound to record our opinion that it was unfortunate that his article on the subject (loc. cit.) was published during the course of this investigation.) At the same time no one can be complacent about this distressing disease, and we should be ready to adopt any method of proved value and incorporate it in "orthodox" treatment so called: Miss Kenny herself has consistently expressed her desire to be of service through regular medical channels. We should therefore have no difficulty in recommending—certainly for an extended period—the continuation of Miss Kenny's system of hydrotherapy in the poliomyelitis unit of this hospital. Having expressed the opinion that this is of value, it would seem foolish not to use the apparatus which has been installed. We see no difficulty and no inconsistency in incorporating this part of Miss Kenny's system, for instance, in a major scheme of treatment which would include splintage where this is thought advisable.

We are in no doubt as to the value of the segregation of cases of poliomyelitis in large special units. This was originally suggested to the Council by Mr. Elmslie and resulted in a unit at Queen Mary's Hospital, with a preliminary period at the Western Fever Hospital because of the supposed risk of infection. The present series of cases seems to have shown that no disadvantage has followed the transference of cases to Carshalton at an earlier stage than hitherto, and we should be glad to see the intensive treatment which has resulted from Miss Kenny's visit continued. Though it is incapable of proof we believe there is no appreciable risk of infection—an opinion which agrees with the generally accepted views on the subject.

Certainly we hope that arrangements will be made for the continued observation of these particular cases for reasons already indicated.

Summary

We should therefore sum up our main conclusions as follows:

1. We have seen no reason to admit Miss Kenny's claim that complete cure can be promised in any group of cases of poliomyelitis.

2. We consider that the use of hydrotherapy in the form of hot and cold douches as practised by Miss Kenny is of value.

3. We consider that very early attempts to initiate voluntary movements and also early and frequent passive movements are harmless but of unproved value. We think, however, it is a legitimate criticism of her method generally that it does not include a number of useful measures practised, certainly in this country, by experienced members of the massage profession.

4. We agree with Miss Kenny that under certain conditions, which we have specified, splints can be dispensed with in the treatment of the early stages of the disease. We do not approve, however, of her entire abolition of splints and surgical appliances in treatment. We consider that they are often valuable and sometimes essential parts of treatment, but, on the other hand, we are equally sure that the mechanical methods which she employs in substitution for splints are inadequate. We would add, however, that we disagree with the long periods of continuous mechanical immobilization which are sometimes imposed.

5. We consider that Miss Kenny has not really faced the issue of residual paralysis, for which we believe surgical appliances or surgical methods such as stabilizing operations offer the only eventual hope of amelioration.

6. Some improvement appears to have been achieved in the cases of cerebral spastic paralysis treated, but Miss Kenny's system demonstrates no original principles.

(Signed)

H. A. T. Fairbank. R. C. Elmslie.
Macdonald Critchley. Geo. M. Gray.
E. I. Lloyd. Henry O. West.
C. Lambrinudi.

MOTOR CARS FOR 1939

THE EARL'S COURT EXHIBITION*

[From our Motoring Correspondent]

Reference was made last week to the increasing popularity of four-cylinder engines for cars up to 12 or 14 h.p. The annual analysis published by the *Autocar*, however, taking all the models together, shows that vehicles with six-cylinder power units are still in the ascendant, the proportion of such models to the total having advanced from 45.5 to 48.2 per cent.; 35.3 per cent. of the new cars have four-cylinder engines, the rise in this case being from 32.5 per cent. The analysis also reveals that cars with four-speed gears are far and away the most popular, the proportion of four-speed gears being 64.1 per cent. as against only 29.4 per cent. for three-speed gears.

The cars to be seen at the exhibition range in taxable h.p. rating from 8 to 51, and in price, taking those with saloon bodywork as a basis, from £120 to about £3,000. The needs of medical men are so varied that no hard-and-fast rules can be laid down as to the most suitable vehicles for their use. Where low travelling costs are important any of the Tens can be relied upon not only to perform satisfactorily but to have a good appearance—a point of some importance to medical men. The majority, however, will probably make their choice among the Twelves and Fourteens.

Alvis, Armstrong-Siddeley, and Austin

The 12/70 four-cylinder Alvis with a saloon body is listed at £435, and as a drop-head coupé at £445. Only slight mechanical modifications have been found necessary, but the bodywork has been re-designed to give more leg- and head-room and at the same time wider seating. There are two new Armstrong-Siddeley models—a Sixteen made in two styles of saloon body, priced at £380, and a Twenty—for both of which a new slogan, "balanced drive," has been coined to draw attention to the harmonizing of the chassis, suspension, and bodywork to provide "restful motoring." Other features of the Sixteen include a new chassis frame and a fluted steel floor, which prevents any engine fumes passing into the interior of the car. Only vehicles with six-cylinder engines are manufactured by the Armstrong-Siddeley concern, which is continuing the Fourteen and Seventeen saloons with only slight modifications, at £335 and £475 respectively.

The Austin company has as usual a wide range, comprising no fewer than twenty-seven different models of cars and seven distinct chassis types—the Seven, Big Seven, Ten, Twelve, Fourteen, Eighteen, and Twenty-eight, the last-named being an entirely new model replacing the former 20-h.p. Austin. The first four have four-cylinder engines, the other three being "sixes." Although there are no radical departures in the latest models, a great number of detail improvements have been made. Thus, the new design of engine with an aluminium cylinder head, last year used only on the Fourteen, is now applied to the Ten, Twelve, and Eighteen models. Providing a higher compression ratio, this innovation, in combination with larger inlet valves on the Ten and Twelve, is claimed to ensure a higher power output with at the same time a reduced fuel consumption. Among other modifications which may be referred to are the higher and wider doors on the Twelve and Fourteen vehicles, the hinged front seat squabs on the Tens to allow greater mounting and dismounting space, and sturdier back axles to withstand the increased engine power on the seven and three next following types. An important feature of the Austin 1939 programme is a reduction in prices of from £5 to £15; as one example it may be mentioned that the Ten sunshine-roof saloon is now priced at £185, or £10 less than last year.

B.S.A., Citroën, Chrysler, and Daimler

A car which may appeal to the younger medical men is the 10-h.p. B.S.A. Scout, the range of which now includes an attractive two-door saloon listed at £196. The chassis, the only one of British construction embodying a front-wheel drive, is provided with a newly designed four-cylinder engine. Among the special features is the location of the change-speed lever just below the centre of the instrument board with the pistol-grip hand-brake lever at its side, so that both these controls are removed from the floor boards. The Citroën company has added two new models to its range of cars—namely, popular saloons on both the Twelve and Light Fifteen chassis at £198 and £208 respectively. Only slight modifications have been made in the Citroën vehicles, which are noteworthy for their independent front-wheel suspension and drive.

For the new season the Chrysler concern has a series of six models ranging in power from 20 to 34 h.p., and in price from £335 to £975. Among the new features are independent front-wheel suspension, an improved form of overdrive in connexion with the change-speed gear, which latter in certain models is controlled by a lever on the steering column, and a new "traffic lights" speedometer dial, which shows a small green light up to 30 m.p.h., amber from 30 to 50 m.p.h., and red at higher speeds. In the latest Daimler Fifteen model the power of the engine has been increased to 18 h.p., to denote which, and also in relation to its progenitor, the name has been altered to the Daimler 2½-litre "15." Except as regards the power unit, the chassis, which has independent front-wheel suspension and, of course, the Daimler fluid flywheel and self-changing gearbox, has not been altered. There is, however, in addition to the saloon, which sells at £485, a new four-door drop-head cabriolet.

Dodge, Fiat, Ford, and Frazer Nash

An interesting car of American design and construction is the Dodge, of which 20-, 24-, and 26-h.p. six-cylinder and 34-h.p. straight-eight models are available. Like the Chryslers, with which they are closely related, the Dodge innovations include independent front-wheel suspension and an improved overdrive to which the name "dual power" has been given, this being designed to come into operation automatically on either top or second gear at speeds as low as 22 m.p.h. A five-seater saloon is available with either a 20- or a 24-h.p. engine at £365. Among the Fiat cars, which are of Italian design, chief interest centres in a new Twelve, which is supplied only with a saloon body at £227; there is, however, a special foursome drop-head coupé body on the 10/12-h.p. chassis at £265.

Although not shown at Earl's Court, it may be mentioned that the Ford Ten car is in future to be known in its improved form as the Ford Prefect. Outwardly it resembles the V-eight model scaled down, with a flat-topped bonnet and streamlined front. The new prices range from £145 for the two-door saloon to £152 10s. for the four-door model. The A.F.N. company has three types of chassis—12-h.p., 14-h.p., and 16-h.p.—bearing the Frazer Nash name, and a series of four six-cylinder models ranging in power from 13 to 25 h.p., known as the Frazer Nash-B.M.W., the name indicating a combination of German chassis with various British modifications. The prices range from £375 upwards, and the body types available include some attractively designed cabriolets and coupés.

Hillman, Humber, and Hudson

The popular 10-h.p. Hillman Minx has been reduced in price for the 1939 season, and, according to the makers' announcements, their latest productions, while remaining basically unchanged, embody no fewer than twenty-five new features, chief among which are the all-synchromesh four-speed gearbox, improved spring suspension, and more space in the front seat compartment. Three models with saloon bodies are available at £163, £166, and £175 respectively, together with an attractive foursome drop-head coupé at £210. A car which should appeal to medical men requiring a more roomy vehicle than the Minx is the Hillman Fourteen, with "evenkeel" independent front-wheel suspension and the synchromesh four-speed gearbox. Two models of saloon cars are available on this chassis—the Safety at £239 and the De Luxe at £255.

* Concluded from page 807.

Various detail improvements have been made in the Humber 16-h.p. and 21-h.p. Snipe cars; the saloons are now listed at £345 and £355. A new departure by the Humber company is the introduction of a Super Snipe car—a British endeavour to provide a big-engined vehicle to compete with American productions. The latest model possesses not only all the usual Humber features, such as the "evenkeel" independent front-wheel suspension, but is provided with a 27-h.p. engine, the "flexibility" of running of which is such that, except when starting, there is practically never any need to change down from the direct drive. It is claimed that a speed of 85 m.p.h. can be comfortably attained in the saloon, which is priced at £385.

Two six-cylinder models (17-h.p. and 22-h.p.) and a 29-h.p. "straight-eight" form the 1939 series of Hudson cars, all of which have undergone various changes in outward appearance. A new mechanical feature—the "auto-poise sway eliminator"—is said to make for greater riding comfort. The 17-h.p. and 22-h.p. saloons are offered at £312 and £360, there being also a convertible foursome coupé on the 22-h.p. chassis at £400.

Jowett, Lanchester, M.G., and Morris

The Jowett 8-h.p. and 10-h.p. cars, which continue as the only vehicles on the market with horizontal engines, and which are very popular with many country doctors, have undergone no radical alteration, but for the coming season embody numerous detail improvements. Despite this it has been found possible to reduce the prices slightly, the two-cylinder saloons being listed at £159 10s. for the standard and £169 10s. for the *de luxe* models, while in the 10-h.p. type there are three saloons at from £179 to £195. The Lanchester company is continuing to confine attention to three types of chassis—11-h.p. four-cylinder and two "sixes" of 14 and 20 h.p. respectively, although the latter is known as an "eighteen." The chief feature of these vehicles is that they all embody the Daimler fluid flywheel and pre-selective self-changing speed gear; various detail changes have been made, but otherwise these cars, which have an excellent reputation for reliability and smooth running, continue as last year. The 11-h.p. saloon is priced at £298 and the 14-h.p. Road-rider at £375. Among the cars appealing to young medical men are those bearing the name "M.G.," of which 10-h.p. and 12-h.p. four-cylinder models and 18-h.p. and 20-h.p. "sixes" are available in open tourer, saloon, and drop-head coupé form at prices ranging from £222 to £468; a noteworthy exhibit is a 10-h.p. "Midget" with Tickford folding-head four-seated bodywork at £269 10s.

The Morris cars continue to maintain their popularity. Although the range continues as before—namely, 8-h.p., 10-h.p., and 12-h.p. four-cylinder and 14-h.p. and 25-h.p. "sixes"—the Eight and Ten are entirely new models, the smaller one, indeed, having been kept back as a show surprise. The new car is bigger than the popular car it has displaced and shows a number of improvements, varying from a four-speed synchromesh gearbox to self-cancelling direction indicators. Four types of bodywork are being provided on the chassis—two open ones and two saloons, the latter ranging in price from £128 to £149. The Morris Ten has been reduced in price to £185 for the sunshine-roof saloon, and has also been re-designed, the all-steel saloon bodywork incorporating the chassis as an integral part. Among the points which will commend themselves to Morris car users are the four-speed synchromesh gearbox, the draughtless ventilation, the roomy passenger and luggage accommodation, and the full-width shelf below the instrument board. In the other three models only detail modifications have been found necessary.

Renault, Railton, and Rover

The Renault company is again showing examples of its 8.3-, 12.1-, and 17.9-h.p. four-cylinder and 29-h.p. "six" models. The smallest chassis has a special form of independent front-wheel springing, while on all four types the rear suspension is by a single transverse spring in place of the usual pair of longitudinal springs. The Renault bodywork is known for its spaciousness, the larger vehicles being able to accommodate three persons on the front seat. Prices range from £140 for the 8.3-h.p. saloon to £295 for the 27-h.p. six-seater.

Included in the range of Railton cars is an attractive 10-h.p. chassis, two examples of which—a two-door three-seater saloon at £299 and a drop-head coupé body for three persons at the same price—are to be seen on the stand of Coachcraft Ltd. The chief new departure in the Rover series of cars—all of which retain an exclusive feature, that of a free-wheel-at-will device—is an entirely re-designed Fourteen six-cylinder model, which is now taxable at 15 h.p. The Rover range comprises 10- and 12-h.p. four-cylinder and 14-, 16-, and 20-h.p. "sixes" at prices ranging from £275 to £478. On each type of chassis the standard bodywork is of saloon type, but on the 10-h.p., 15-h.p., 16-h.p., and 20-h.p. chassis coupé bodies are also available.

Singer, S.S. Jaguar, Standard, and Sunbeam-Talbot

The Singer company is concentrating its energies on three types of four-cylinder cars—9-h.p., 10-h.p., and 12-h.p.—in which only minor modifications have been found necessary. Prices for saloons range from £149 10s. for the Bantam Nine to £249, there being also a special drop-head coupé body on the 12-h.p. chassis at £279. Another concern which is continuing its 1938 Jaguar models with only minor changes is S.S. Cars Ltd. Two "sixes" (20-h.p. and 25-h.p.) and 14-h.p. four-cylinder models are available, with saloon and drop-head coupé bodies constructed on attractive lines at prices ranging from £298 to £465.

The most striking feature of the Standard company's 1939 range of cars is the introduction of three new models—8-h.p., 10-h.p., and 12-h.p.—with independent front-wheel suspension. In other respects the vehicles follow the Standard general practice, and in view of their comparatively low prices are likely to be popular during the coming season. The 9-h.p. and 14-h.p. "fours" and the 20-h.p. "six" are being continued with only minor changes. Standard car prices range from £125 to £325; with the exception of an 8-h.p. open tourer and a 12-h.p. drop-head coupé all bodywork is of saloon type.

As the result of an amalgamation between the two concerns, the Talbot cars are now known as the Sunbeam-Talbot. Although 21- and 27-h.p. "sixes" are available, chief interest from the point of view of the medical man centres on the four-cylinder Ten, which is offered at £265 in saloon form and at £285 as a foursome drop-head coupé; the principal modification is the increased bodywork space, resulting from the engine having been moved forward three and a half inches in the frame.

Triumph, Vauxhall, and Wolseley

Another popular car is the Triumph, the range of which comprises 16-h.p. "six" and 14-h.p. four-cylinder models. Chief alterations in the latest models are larger engines, wider radiators, more roomy bodywork, and the addition to the saloons of a 16-h.p. roadster coupé. Externally the Triumph cars have an attractive appearance, and their prices range from £312 to £450. For the 1939 season the four-cylinder Vauxhall Ten with integral chassis and bodywork frame, together with independent front-wheel suspension, is being continued with but slight modifications. The chief feature of the Vauxhall programme is the introduction of a new Twelve-Four; replacing a "six" of the same horse-power, this embodies all the special features of the Ten, and is offered at the attractive price of £189 for the standard saloon and £198 for the *de luxe* sliding-roof saloon. The Vauxhall Fourteen six-cylinder model is being continued at £230 with many new features, including a more roomy saloon body, hydraulic brakes, synchromesh gearbox, and adjustable steering wheel. Finally there is a 25-h.p. "six" at £345. A special feature of the Vauxhall series is the attention which has been paid to the matter of economy in fuel consumption.

Concentrating its activities largely on six-cylinder cars, the Wolseley company, in addition to continuing the 12/48-h.p. four-cylinder model and 21-h.p. and 25-h.p. "sixes," has introduced three new chassis with power units rated at 14/60 h.p., 16/65 h.p., and 18/85 h.p All are fitted with powerful silent-running engines and four-speed gearboxes with synchromesh gears on second as well as third and top speeds; the prices range from £245 for the 12/48-h.p. saloon to £395 for the 25-h.p. chassis with five-seater saloon body.

Special Motor Bodywork

Despite the excellent finish of what may be termed the mass-produced modern vehicle, which fully meets the requirements of the majority of medical men, there is still a section of the motoring public which prefers to make its car purchases in chassis form and have body-work fitted to meet individual preferences. Because of this a section of the show is still devoted to a display of special coachwork, not necessarily for the high-powered car, but also for such popular makes as Austin, Hillman, Morris, Standard, and Vauxhall. In this section, as being useful for doctors, attention may be drawn to the Tickford (Salmon and Sons) and Redfern-Maltby (Maltbys Motor Works and Garage Ltd.) "all-weather" vehicles, which can be quickly and easily altered from being entirely closed to fully open form and vice versa. Some excellent specimens of British coachbuilding are also to be seen at the stands of Mann, Egerton and Co. Ltd. and Offord and Sons Ltd.

At the stand of the last-named firm there is a 25-h.p. Wolseley seven-seater limousine the Offord body of which has been specially designed for the use of a lame person or invalid. Briefly, the construction is such that half the usual wide rear seat is omitted so that its place can be taken by a comfortably upholstered spring-mounted invalid's wheeled chair. Thus, the passenger for whom it is intended can take his seat in it either in, or at the door of, the house and then be wheeled up light detachable runners into the car, the chair, with its occupant, being then manœuvred and securely clamped in position; the runners when not in use are detached and carried in the luggage boot of the vehicle. This arrangement can be embodied in new or old cars provided the doors are of sufficient width. I learned at the exhibition that the demand for conversions is proving much larger than was at first anticipated.

Motoring Accessories

As usual, the galleries at Earl's Court are devoted to an almost bewildering display of motor accessories. At this time of the year, when severe weather conditions may be experienced, attention may be drawn to the display of radiator muffs to keep the engines warm when cars have to be left standing in the street, and to the numerous non-freezing preparations for radiators and garage-heating lamps and stoves, which prevent the freezing-up and possible cracking or bursting of engine cylinders and radiators during frosty weather. There are also several new appliances for warming the interior of cars in cold weather. Among these is the A.C. made by the A.C. Sparking Plug Co. Ltd. Actually the core of this new heater is itself a tiny honeycomb radiator, through which a small quantity of hot water is by-passed from the engine radiator, a miniature electric fan being mounted behind it to drive heated air into the interior of the car. As the quantity of hot air supplied depends upon the spread of the fan it is possible to adjust the temperature within the car over a wide range. The makers state that the ideal position for the heater, which is made to operate in conjunction with 6- or 12-volt batteries, is centrally in front of the change-speed gear lever; it can be fitted to all cars having a pump or impeller in the water-circulating system. Other car heaters include the HaDees exhibited by S. Smith and Sons Ltd., and the Tropic-Aire appliance of S. Guiterman and Co. Ltd.

Medical men, especially those whose practices are located in country districts, would be well advised to have the bulbs of their car lamps overhauled occasionally and possibly renewed. Like those used for house-lighting purposes, car bulbs are regarded as having a useful life of about 1,000 hours, after which their lighting capacity falls and there is a risk of the filaments breaking. It is advisable, too, to carry a supply of spare bulbs. Small cases containing spare bulbs are made by Lucas's and the other principal lamp manufacturers, and they can be ordered through any local garage.

C. J. W.

Reports of Societies

NOMENCLATURE OF DISEASES OF THE FUNDUS

In newly taking the chair of the Section of Ophthalmology of the Royal Society of Medicine on October 14, Mr. Malcolm L. Hepburn devoted his address to a discussion of nomenclature. He considered that the time had arrived when it was desirable to reconsider the nomenclature of fundus diseases in the light of present pathological knowledge. In the past, when few eyes were subjected to microscopical examination, it was necessary to be content with pictorial descriptions of the condition as seen with the ophthalmoscope. As the details of even the same type of case might vary from time to time the name given to any particular picture often depended on the stage in the pathological processes at which the case was first seen. Sometimes the same name had been applied to entirely different fundus pictures and a different name to the same picture. Mr. Hepburn showed a number of examples, some of them from classic work, though he was careful to preserve the anonymity of all of them. The present position was that several entities were entirely unnecessary and failed to form the basis for reasonable classification, while a number were actually misleading. The phraseology still in common use was not infrequently ambiguous and even devoid of meaning; but until there was universal agreement regarding the names that should be retained and those that should be given up it was impossible to begin any reconstruction of a new nomenclature.

Mr. Hepburn suggested for a new nomenclature that (1) every disease of the fundus should be described in terms of one pathological whole, with reference to choroid or retina or both, and comprising all the details contained in the picture; (2) when the pathology was unknown the resort to a pictorial or a non-committal pathological term was unavoidable; and (3) before coming to a decision on any particular fundus condition the clinical history should always be considered.

BIOCHEMICAL ASPECTS OF GROWTH

At a meeting of the Manchester Medical Society on October 5 Professor H. S. Raper delivered his presidential address on some biochemical aspects of growth.

Professor Raper said that the problems of growth were in part biochemical, since fundamentally the process involved the synthesis of new living matter. Contributions to the subject had come from very varied quarters during the present century, and had all shed some light on it. Studies of the material basis of growth in animals had shown that new protoplasm could only be produced if certain amino-acids were provided. The presence of these "essential" amino-acids in dietary proteins had been made the basis of important recommendations as to the minimum protein requirements in human nutrition. The use of *x* rays in the investigation of protein structure had already revealed something of the architecture of the

protein molecule, and as protein seemed to be the essential basis of protoplasm this knowledge was valuable to the biochemist seeking to determine the mechanism of protein synthesis in the living cell. A fascinating field for the study of protein synthesis had been opened by the discovery of crystalline virus proteins. These were able to multiply automatically inside plant tissues and probably represented the most elementary process of growth yet known.

Growth Stimulants

Many substances had now been discovered which might be classified as growth stimulants. Some, like certain of the vitamins, the growth hormone of the anterior pituitary gland, and the growth-promoting substance present in embryonic tissues, had a general effect. So far as could be seen at the present time they played the part of catalysts in promoting the synthesis of new living material, though it was possible that some of them might be essential components of protoplasm. Other growth stimulants were more specific and appeared to act only on certain types of cell. In this category came those sex hormones which were responsible for the development of secondary sex characters and for changes in the sex organs occurring during oestrus and pregnancy. The action of these substances was allied to that which took place in the differentiation of the embryo. It seemed likely that this action was truly catalytic because it could be imitated, in some instances almost exactly, by synthetic chemical agents which were not allied in structure to the naturally occurring hormones.

The fact that many bacteria would grow and multiply in an inorganic medium if a suitable source of carbon was supplied suggested at first sight that growth promoters were not essential to them. What was more likely, however, was that such organisms were able to synthesize all they required from the elementary substances supplied, and these included growth stimulants because it had been shown conclusively that bacteria which would not grow in such media grew well if certain substances were provided in small amount. The addenda required comprised vitamins (particularly of the B group), unknown substances present in animal tissues, and certain amino-acids.

The study of plant growth had also received a new impetus from the discovery of auxins, which might be styled plant growth hormones. These were present at growing points in the plant and were probably growth catalysts, since their action might be largely imitated by synthetic organic compounds of quite a different nature. A survey of the various fields of study in which the biochemical aspects of growth were being investigated gave good grounds for the expectation that in the coming years a much clearer understanding of the process would emerge.

SOME ASPECTS OF HEREDITY

At the opening meeting of the session of the West London Medico-Chirurgical Society, held at the De Vere Hotel, Kensington, on October 7, the new president, Dr. Maurice Shaw, gave an address from the chair, taking as his subject "Heredity." He gave a careful exposition of the laws of Mendelism, and followed this with an exposition of the work of T. H. Morgan of Columbia University, only second in importance, he said, to that of Mendel in building up the theory of the "gene." Dr. Shaw appealed for greater interest on the part of the medical profession as a whole in the science of eugenics. This was the more important because orthodox medicine tended to be dysgenic in its action. The profession was largely responsible for perpetuating dominant defects which, but for its "misguided efforts," would probably die out. The insulin treatment of diabetes was probably the most obvious example. It was known that diabetes might be hereditary, although its exact mode of inheritance was uncertain. If untreated, a very large number of young diebetics would never survive to marriageable age. The introduction of insulin had entirely altered the picture, and a majority of this type of diabetic might now be expected to marry, ensuring a steady increase in the incidence of the disease in the next few generations. Tuberculosis was another example if the hereditary predisposition, which was denied by some quite competent observers, were accepted; though inasmuch as tuberculosis required an environmental as well as a hereditary factor, there was more chance that the disease might ultimately be eliminated.

Ought not the medical profession, by interesting themselves in eugenic theory and practice, to try to counteract a little of the harm they inflicted upon the race by their wanton interference with Nature's principle of natural selection? This was scientifically possible, for it merely meant the application of the principles of stockbreeding to human affairs. There were several lines along which the problem could be tackled, one of the most obvious being that of sterilizing all individuals who might distribute a harmful gene among the general population. A difficulty in the approach to eugenics along the path of sterilization, however, was that mutations, whereby all harmful genes must originally have arisen, could not be prevented from occurring. In conclusion, Dr. Shaw discussed some purely medical aspects of heredity, especially the inheritance of blood groups. A vote of thanks to him was accorded on the proposition of Dr. Julius Burnford, seconded by Mr. A. E. Roche.

The 843rd ordinary meeting of the Brighton and Sussex Medico-Chirurgical Society was held at the Royal Pavilion, Brighton, on October 6, when the president for the year, Dr. J. G. Hayes, gave his presidential address, entitled "Thirty Years of General Practice," and several members then related their own experiences during a similar number of years.

Local News

ENGLAND AND WALES

New Laboratories of the Metropolitan Water Board

The new laboratories of the Metropolitan Water Board—a three-story building containing some fifty laboratories and supplementary rooms with the most modern equipment for water examination—were opened by the Minister of Health (Dr. Walter Elliot) on October 17. The building has been erected at Clerkenwell, adjacent to the head offices of the Board, on the very spot where, in 1613, Hugh Myddelton brought the "sweet waters" of Hertfordshire to what was then the confines of London. The key with which Dr. Elliot performed the opening ceremony was contained in a box made of the oak used by Myddelton in constructing the "round pond" which formed New River Head. The Metropolitan Water Board has had its offices at this site ever since, in 1904, it took over the water undertakings of London, but its laboratories have been in Nottingham Place, Marylebone, in houses built for other uses. There for a third of a century "the watch on the water" has been maintained day after day, a vast routine examination of samples has been carried out, together with a great deal of original research. During last year, for example, the number of bacteriological samples taken was over 22,000, of chemical samples nearly 6,000, and of biological samples over 3,000. One remarkable piece of work carried out for many years at Nottingham Place has been the routine photomicrography of the algal content of the water from all the Board's storage systems. Some 22,000 such photographs are now bound in albums. The work of the laboratories, however, has suffered from restricted space in not quite suitable

premises, and now it is to be transferred to Clerkenwell, where the new laboratories are worthy of the leading water authority in the world and the pioneer of purification processes. Unfortunately, neither of the two men whose names will always be associated with this work lived to see its completion. Sir Alexander Houston was for twenty-eight years director of water examination, and on his death in 1933 Lieutenant-Colonel C. H. H. Harold was appointed to succeed him. Harold's sudden death in July last cast a shadow over the new enterprise which owed so much to his initiative and imagination. He had visited more than twenty cities in the United States and Canada to ensure that the choice of services and equipment for the new laboratories was in line with the most modern practice.

The main function of the new laboratories will be to organize mass performance of special water tests supported by highly technical examinations. The tests fall into three sections to which, roughly speaking, the three floors of the laboratory correspond—namely, biological on the ground floor, bacteriological on the first floor, and chemical on the top floor—and the administrative department includes the arrangements for the collection of samples and their interpretation and statistical recording. The laboratories are disposed on a chain principle so that the work proceeds as far as possible from one room to the next. The bacteriological section is of particular interest. It has been so designed that cleansed sterilized receptacles receive their quota of media and are plugged and sterilized before arriving at the media stockroom. From thence they travel to the main general laboratory, and after the samples have been put up they are trolleyed into the controlled temperature rooms, which operate respectively at 22°, 37°, 42°, and 45° C. After incubation the tubes are sorted in the sorting-room and the positive tubes pass on to the subculture room for further study. A dark counting-room adjoins for the performance of special counts and the reading of agglutination results. One feature to which special attention was drawn was that rooms are being used instead of a number of box incubators, a departure which permits of enormous expansion in the future. The arrangements in the 22° C. room are also of interest, as this is a difficult temperature to maintain. The temperatures of all the rooms are thermostatically controlled and recorded, and the amount of air current regulated in accordance with humidity readings. Special ventilation is also employed to minimize condensation in view of the large amount of fluid being incubated.

London Medical Exhibition

To the London Medical Exhibition, which has been held during the past week at the Royal Horticultural Hall, Westminster, about 120 firms contributed, and the stands as usual were filled with a varied display of products. So varied, indeed, that one visitor at least wished that exhibitors, having learned many of the arts of display, might emulate the economy of the West End milliner who devotes her whole window space to a single bonnet. It was quite refreshing to come upon a stand which concentrated on a single article—rubber gloves and nothing else, or a brand of mustard, or a medicated wadding. When it comes to medicinal and food preparations—and more than half the stands were of that character—the variety almost took one's breath away. Quite a dozen firms showed sulphanilamide under some name or other. There was also what Sir Henry Dale at Guy's Hospital the other day described as a "bewildering and redundant profusion of symptomatic remedies." Surgical instruments were less conspicuous, and in view of the place which physical medicine now occupies there did not seem to be quite an adequate representation in that field. On the other hand, there were several exhibits of great interest to the ophthalmologist; hearing aids also were more in evidence than ever before. A number of bookstands, including that of the British Medical Association, gave a pleasant relief. More than one stand was devoted solely to contraceptive appliances, one of them announcing that seven of its products were on the approved list. An instrument to which a good deal of attention was paid was an electrical stethoscope in which the incorporation of a frequency range selector made it possible for the operator to emphasize sounds of one particular tone; it was also provided with a second set of auricles, enabling two physicians to participate simultaneously in an examination. Another device was a portable resuscitator for respiratory emergencies—drowning, carbon monoxide poisoning, anaesthesia, shock, and war gases. Equipment for oxygen therapy was demonstrated, including the installation of pipe-lines in hospitals and nursing homes for the supply of gas from a central cylinder to various points in the wards.

Central Midwives Board

It was reported at a meeting of the Central Midwives Board for England and Wales on October 6 that, acting on the powers conferred upon him by Minute 40 of the meeting of July 7, 1938, the chairman had approved as lecturers: C. M. Gwillim, M.D., F.R.C.S., A. L. Gunn, M.D., F.R.C.S., W. C. W. Nixon, M.D., F.R.C.S., J. Sakula, M.D., R. Christie Brown, M.S., F.R.C.S., Albert Davis, M.D., F.R.C.S., and R. L. Dodds, M.B., F.R.C.S. Approval as lecturers was also granted to Mary Florence Bignold, M.B., Ch.B., Samuel Davidson, F.R.C.S.Ed., and Robert Newton, M.D. The chairman reported that acting under his vacation powers he had decided to grant applications for the inclusion of Radcliffe Infirmary, Oxford, and the Sussex Maternity and Women's Hospital in the list of institutions approved for the special instruction (required by the Board's ruling on the administration of nitrous oxide and air by midwives) in the essentials of obstetric analgesia and in the use of a recognized apparatus.

IRELAND

Some Vital Statistics for Northern Ireland

The report of the Registrar-General for Northern Ireland, which has just been issued, records an increase in the death rate and a reduction in the marriage and birth rates. The number of births registered was 25,412, a rate of 19.8 per 1,000 of the estimated population; this decline finds a parallel in England and Wales, though in the latter area it is more steep and the rate is lower. The general death rate was 15.1 per 1,000 of the estimated population, being slightly higher than last year, but in common with the experience in England and Wales demonstrating a general downward trend over the past twenty-two years. A severe epidemic of influenza in the first quarter of the year accounted for an unduly large number of deaths, while deaths from diphtheria, scarlet fever, and diarrhoeal diseases in children showed marked decreases. The number of deaths from influenza was 1,148, giving a rate of 0.9 per 1,000 of the population, compared with 0.21 in 1936. The general downward trend in the death rate from tuberculosis continued, the rate being 0.98 per 1,000 of the population, a figure somewhat higher than that for Scotland and England and Wales, but lower than that for Eire. It is noted that almost one-half of the deaths from all forms of tuberculosis during 1937 occurred between the ages of 15 and 35 years. The cancer death rate was 1.3 per 1,000 of the population, maintaining a fairly steady rate. The most frequent sites of fatal cancer among males were: stomach, 216; intestines, 114; rectum, 65; prostate, 47; and liver and gall-bladder, 35. Among females the stomach was affected in 188 cases; intestines in 127; breast in 115; uterus in 108; rectum in 42; and the liver and gall-bladder in 50. The death rate from diseases of pregnancy and childbirth showed a welcome decrease from the figure of 1936, the rate having fallen from 6.06 per 1,000 births to 5, this figure being just a little above the previous lowest figure (that of 4.8 in 1927). Infant mortality continued to take its toll, the figure being 1,969, representing a rate

of 77 per 1,000 births registered, the same as for 1936. The rates during 1937 and 1936 (respectively) were: in England and Wales, 58 and 59 per 1,000 births; Scotland, 80 and 82; and Eire, 73 and 74. The infant mortality for the county borough of Belfast was 94 in 1937, as compared with 109 (1932), 101 (1933), 81 (1934), 112 (1935), and 101 (1936).

Royal Maternity Hospital, Belfast

The Registrar of the Royal Maternity Hospital, Belfast, has issued his annual report, in which is recorded a highly successful year's work in the hospital. Full clinical details of the twenty deaths out of 1,729 admissions (mortality rate of 1.15) are given; in 1936 the rate was 1.24, and in 1935 1.6. Of the total admissions 396 were emergencies, and no fewer than eleven of the twenty deaths occurred among these patients. The maternal morbidity rate was 6.7 per cent., as compared with 8.2 in 1936 and 4.9 in 1935. No maternal deaths occurred in the cases of eclampsia, and there was only one fatality in the thirty-two patients with heart disease, of whom twenty-four were suffering from mitral stenosis. Multiple pregnancy occurred in twenty-one cases; there were eighty-five deliveries as breech and twenty-one as persistent occipito-posterior presentations. Caesarean section was performed on fifty-seven occasions, in the majority of the cases on account of contracted pelvis or disproportion; the lower segment operation was the method chosen in forty-two instances. Other tables give full records of forceps deliveries, accidental haemorrhage, and the induction of abortion or premature labour. Valuable features of this report are the details and tables relating to foetal mortality and premature infants. The information concerning premature infants is not included in all maternity hospital reports, and is a practice which might be more widely adopted.

Dublin Fever Hospital Board

The annual report of the medical superintendent of Cork Street Hospital, Dublin, appears this year as part of the first report of the Dublin Fever Hospital Board since the change from voluntary to municipal control. A brief glance at the statistics given by Dr. McSweeney for the year 1937 reveals a general improvement on the corresponding figures for the previous year. The general mortality rate was 6.66 per cent., as against 8.39 for 1936 and 8.71 for 1935. There was a sharp increase in the incidence of scarlet fever at the end of 1935, which continued through 1936; this incidence fell in 1937, the number of cases treated being 624, as compared with 976 the previous year. While diphtheria continued to be of a high degree of virulence and accounted for some 40 per cent. of the total deaths in the institution, the case mortality of 9.1 per cent. shows an improvement on the 1936 figure of 12.57. Of the fifty-nine fatal cases thirty-five were moribund on admission. Dr. McSweeney comments that "it is a matter for regret that cases do not receive medical aid at an early stage of the disease. . . . It is still not uncommon in Dublin for patients to be admitted to hospital who have been ill with diphtheria nearly a week." Some form of diphtheritic paralysis was exhibited by fifty-eight patients; nine with respiratory paralysis were treated in the Bragg-Paul pulsator and recovered. There were two deaths among these fifty-eight cases. An investigation into the problem of diphtheria in Dublin with particular reference to ascertaining the prevailing types of organism has been in progress in the hospital under the auspices of the Irish Medical Research Council since October, 1937. Fifty-eight cases of meningitis were dealt with during the year, of which thirty-five were of the meningococcal variety. The mortality among these thirty-five cases was 60 per cent., as compared with 78.2 per cent. in 1936. The better results, the report states, were partly due to the use of American sera and to the employment of chemotherapeutic remedies as an adjuvant to serum. Several unusual forms of meningitis were encountered during the year: one case of paratyphoid B infection of the meninges is believed to be the first to be recorded in the literature. On the subject of chemotherapy Dr. McSweeney says that some cases of puerperal septicaemia, due to the haemolytic streptococcus, were found to be quite resistant to this form of treatment, but that the sulphanilamide group of preparations was proving a specific remedy for erysipelas and had replaced serum therapy in the practice of the hospital.

Correspondence

R.M.B.F. Christmas Gifts

Sir,—Each year for nearly thirty years Christmas gifts have been sent, in the spirit of good cheer, through the agency of the Royal Medical Benevolent Fund, to members of medical families whose poverty and distress, often coupled with infirmity, illness, and loneliness, have made their ageing days a pitiful existence. Those who have received the gifts are old medical practitioners or their widows and daughters, who are debarred from any luxury or lighter pleasures in life. What luxury or extra pleasure can be enjoyed on an income of £90 a year, which has to meet all the necessities of life?

Will you help us again in making this appeal known to your readers? The Committee has felt that this is a matter which always appeals to the warm and generous hearts of medical men and women, and that no broadcast appeal should ever be made to the general public. "The family" to whom our gifts are sent is a very large one, and we need over £1,000 if each one of our beneficiaries is to receive the customary Christmas gift of 30s. This can be done only if we receive the same generous response as last year. I know that the present days are difficult, but everyone could spare a small contribution to add to the pleasure of those whose lives are sad at Christmas time. Please send donations, large or small, to the honorary treasurer, Royal Medical Benevolent Fund, 11, Chandos Street, Cavendish Square, London, W.1.

I thank all for their help and co-operation in past years in our Christmas gift scheme, and shall be deeply grateful for a generous response to this appeal.—I am, etc.,

Thos. Barlow,
President.

Civil Medical Organization in War

Sir,—In common with most, if not indeed all, of your readers, I have been greatly interested in your leading article (October 8, p. 749) and the correspondence arising therefrom in your issue of October 15 (p. 810). Since the year 1930 I have been a member of five committees, which have met under the aegis of three Government Departments. Each one of these committees was appointed to consider the provision to be made, by hospital beds, ambulance services, etc., for casualties arising from air raids upon London. The first four of these committees expired without any indication as to why our work was terminated and without having produced any definite scheme. We certainly accumulated an enormous mass of valuable information, but, so far as I am aware, it was not translated into any practicable scheme. Moreover,

inasmuch as personnel of each of the four committees, with the exception of myself, was substantially altered in each committee, a good deal of valuable time and energy was inevitably wasted in starting the work of each committee.

The fifth committee was the so-called Wilson Committee, appointed by the Secretary of State for Home Affairs in the spring of this year. This committee, of which again the personnel, with the exception of myself, was entirely new to the work, certainly did some strenuous work and presented an interim report of its findings to the Minister of Health about the middle of July. The interim report dealt almost entirely with certain important principles which required the approval of the Minister before any detailed consideration could be given to their practical application. The committee adjourned after the presentation of its interim report and has not met since. Personally, I think it is just as well that it has not met, as it will be quite obvious to everyone that the unexpectedly rapid development of events in Europe during the months of August and September made it essential that the problems involved in A.R.P. measures were of so urgent a character that at that period they could be dealt with much more expeditiously by the direct executive action of the staff of the Ministry of Health than by the cumbersome procedure associated with *ad hoc* committees. Herein, therefore, lies the explanation for the lack of any carefully-thought-out schemes for hospital casualty services, ambulance services, and first-aid "posts," etc.

The next point to which I should like to refer is that in my judgment far too much attention has been concentrated hitherto upon the provision *within the County of London* of an enormous number of hospital beds for casualties. The minds of nearly all those with whom I have come into contact on this problem seem to me to be obsessed with this idea of providing 50,000 or more beds in London for such casualties, whereas it would seem to me to be infinitely more important to provide the *minimum* of beds for such purposes in London and the *maximum* outside London. A friend of mine discussing this point with me some time ago said quite truly, "When 50,000 beds are required in London to deal with air raid casualties, the war is over." I asked him why, and his answer was: "Such figures could only become necessary because our anti-air defence organization had completely broken down"; and, he added, if that were so, "not even 50,000 beds would be any use at all, as the population of London would be completely at the mercy of the attacking air bombers." Whether my friend is right or wrong, the fact remains that the policy of concentrating large numbers of beds for casualty cases in London is open to many serious objections for other reasons. For example, no serious consideration seems to have been given to the legitimate needs of the sick poor—whether acute medical, surgical, or maternity, etc.—nor to the immense difficulties which might arise in connexion with breakdowns in the supply of electric current, gas, water, and other public services, nor to the difficulties of transport, especially of perishable foods, fuel, etc. One cannot ignore either the enormous additional risk to the lives of a large number of skilled medical, nursing, technical, and other hospital staff, particularly in the cases of the large medical school hospitals, if, in fact, they were concentrated under one roof, as they have to be if such schemes as those outlined in the case of University College Hospital were carried out. There is no particular reason why a medical school hospital should enjoy any less risk from being blown up by a high-explosive bomb than any other building, but if it did happen the loss of skilled staff would be very serious in a period of emergency. The risk does not appear to me to be justifiable. I would rather advocate the division of the County of London into five regional areas; that in each of those areas the estimated number of beds required should be divided up between twenty or even thirty hospitals, voluntary and municipal; and that the surplus staff of the voluntary hospital medical schools and other voluntary hospitals should be organized to form "mobile units" which would serve not only any of the hospitals in the regional area but also, if possible, the associated hospitals (base hospitals, as they are called) on the outskirts of London. Such a scheme would greatly reduce the risks to patients and staff, and greatly lighten the burden of transport, both for the movement of patients within and without the County of London. Moreover, it would not seriously interfere with the provision of a reasonable amount of hospital accommodation for the "sick poor" or the progress of medical education.

There are two other matters of fundamental importance which have not been properly organized up to the present—namely, ambulance services and first-aid posts. The former is, of course, an essential element in any A.R.P. scheme for dealing with casualties either in hospital beds or at first-aid posts, and its importance needs no elaboration from me, but it is nevertheless a remarkable fact that up to the last moment there was no properly organized ambulance service scheme for London. The position with regard to first-aid posts was even worse. It is not an exaggeration to state that, generally speaking, the scheme was hopelessly inadequate when considered from the point of view of London as a whole. Those who are familiar with the problems involved in the matter of hospital bed accommodation for casualties and ambulance services will, I feel sure, agree with me that unless there is a really first-class organization for first-aid posts, any scheme, however perfect, for hospital beds and ambulance services will completely break down because they would be "flooded" with masses of minor casualties which could and should be dealt with on the spot and sent home afterwards.

Finally, I would add my firm conviction that any efficient scheme for A.R.P. in London must include under "unit control" all hospital beds, ambulance services, and first-aid posts. Any division of authority and control between these three component parts of the scheme will prove in practice to be fatal to success. I need hardly add that I include all voluntary and municipal hospitals in the words under "unit control."—I am, etc.,

London, Oct. 16. FREDERICK MENZIES.

SIR,—Your leading article and the letters you have published are depressing. It is easy to lose one's temper, almost as easy to impart to a political friend (or one's M.P.) authentic particulars of gross incompetence within one's own knowledge. Any man over fifty knows the utter futility of either reaction. Either one's political friend will do nothing whatever or, more probably, he will use the information simply to help him to score some point in the party game.

We, as a profession, can play a nobler part. We can, building on the facts already assembled, make a complete register of our individual resources and a detailed plan for the utilization of our services. I am interested (for obvious personal reasons) in a minority of our profession. On the *Medical Register* are the names of hundreds of men and women whose *immediate* value for what the public would call medical work is negligible. Probably, even under the present chaotic conditions, a few of them would be utilized in the services for which their special

training and experience have fitted them, but only a few. I am prepared to argue—at almost any length—that, even in war-time, statistical knowledge is of national importance. But I simply cannot conceive of a well-middle-aged professor of medical statistics being entrusted with any national statistical work whatever. The fellow is a *medical* man, and what on earth have "doctors" to do with statistics? The same remark applies to other "doctors" whose normal avocations are even more remote from clinical work.

The objection I so crudely phrased above is sound. A "doctor" *is* different from other people. As a technician he may have become hopelessly inefficient, but nobody who has been through the mill of a medical curriculum is ever again a "layman." There must always be a number of duties which any doctor can perform better than a layman. I could make a long list of them. Here is one that leaps to the eyes. If literally millions of children and women are to be evacuated from towns into villages and the open country, emergency sanitary organizations must be devised. The working of these will need much supervision. No doubt elderly sanitary inspectors or retired N.C.O.s of the R.A.M.C. would, from the technical point of view, do such a job as well as doctors, but the real doctor would have a certain prestige with the laity which has a psychological importance. I need not go on with the list. The point I am trying to make is that *all* of us can be fitted into a national scheme, given time and thought. Simply for the pleasure of doing an intellectual job of work well it is worth while carrying on what has been begun. No doubt official contempt, general indifference, and personal vanities will mar the plan. But we shall have done our duty, and although truth seldom prevails it is never quite impotent. —I am, etc.,

Loughton, Oct. 15. MAJOR GREENWOOD.

SIR,—It is indeed time for plain speaking. No one is likely to hand any bouquets to the Ministry of Health or the Home Office for their handling of the preparations to deal with air raid casualties, but before the stones are hurled would it not be advisable to examine the glass in the B.M.A. windows?

The B.M.A.'s scheme of national medical service is based upon the perpetuation of the individual practitioner as a unit to himself, the utilization of the general voluntary hospitals as a separate unit receiving funds but no control from the local authority, the control of the health services of the country by means of practitioner representatives on the public health committees of the local authorities.

In the face of such proposals, you, Sir, expect the central authorities to prepare comprehensive schemes capable of meeting national emergencies. In a crisis there must be leaders with powers; toes will be trodden upon and someone may suffer the loss of a little prestige, but no proper organization is possible without powers. The preparation of any scheme which is to be of value is dependent upon the local authority having control of all the medical services in its area. The present position is chaotic. That being so, is it not time that the British Medical Association helped the Government by formulating at once a scheme of national medical service which will give the local authorities the necessary powers to enable them to meet a crisis? That at least would be helpful.—I am, etc.,

Boston, Lincs, Oct. 10. W. G. BOOTH.

Air Raid Precautions

SIR,—The evacuation of school children in a time of crisis presents difficulties and needs organization. I cannot say that I have been favourably impressed by the methods employed in the recent crisis. I suggest that if time and money permit permanent school camps be established in the country. They should have some permanent buildings, sufficient to house a number of school children transferred from towns to receive the benefits of country life. The camps should be capable of rapid expansion so that their population could be increased with ease. There is no hardship in living under canvas, and canvas should be used if there are not enough huts. The water supply, sanitation, sick-room accommodation, and medical service should be arranged for quiet times and to meet times of crisis. Non-perishable food could be in store.

Such a scheme would have many advantages both in peace and war. It would be better than a hurried evacuation to country places that have not received notice and can only with difficulty provide accommodation, and that of an unsuitable character. Many cottages in the country have a scanty and barely adequate water supply for the usual inhabitants; an influx of town children would be beyond their capacity. Town children are used to turning on taps, pressing electric switches, and pulling plugs. It would take time for them to assimilate cottage ways without doing damage to their hosts and themselves. Town children recently were evacuated with two days' rations. Unless there was a better organization than was seen recently there would be a shortage of food for them after two days, and what then? Charity would have to step in. —I am, etc.,

London, W.1, Oct. 13. CHARLES MILLER.

SIR,—The appalling carnage caused by modern high explosives in densely populated districts is well known. One shell, we read, caused 200 deaths during a bombardment of Shanghai. The total number of casualties from this single shell must, of course, have been very much higher. It does not need much imagination to realize that if London or any other city was ever subjected to bombardment on a large scale the casualties would be greater than could be dealt with even by the most efficient medical service.

Apart from evacuation, which takes time, and could not be carried out quickly enough in the event of the sudden outbreak of hostilities, there is one plan which could reduce the number of casualties to a reasonable level, and this is the provision of adequate shelters. In a recent bombardment of Madrid 205 shells were fired into the city with a loss of only four persons killed and but thirteen injured. Such an extraordinarily low casualty list is due mainly to the fact that adequate shelters, proof against anything but a direct hit from a large shell or bomb, are provided in Madrid.

Either there is a risk of war or there is not, and so long as this risk remains in Europe it is essential in my opinion that adequate shelters should be provided in all British cities if we wish to keep civilian casualties in bombed areas to a sufficiently low limit so that each casualty can obtain proper medical and surgical attention. I feel convinced that the time for providing these shelters is now, and I believe that the majority of doctors, and in particular those with war experience, will agree with me, for my observations are based on a careful consideration of what modern warfare means. It is useless to provide the most efficient medical service conceivable if the number of casualties is going to be tens of thousands, all occurring in the space of a few minutes.—I am, etc.,

London, W.1, Oct. 16. CLEMENT FRANCIS, M.B.

Decline of Breast-feeding

SIR,—I hope that Dr. J. C. Spence's admirable paper on breast-feeding will lead to some practical results. He points out, and it is very important, that the handling of the problem lies with the woman, and tells of what a sagacious woman can do. But in this case matters are worse than in the parable of the ten virgins; for one wise virgin there are nine foolish ones. Improvement of the position can only come with a real education and training of pupil-midwives, health-visitors, and nurses. It is not enough for the nurse to say, with the solemn emphasis of an article in the creed, "Breast-feeding is best," and then, as soon as some trivial difficulty occurs, advise weaning.

The place for such training is in the paediatric service of a teaching maternity hospital, which includes a follow-up baby clinic. In Edinburgh at the Royal Maternity Hospital we have such a service, and theoretical and practical training in breast-feeding and infant hygiene is given to the pupil-midwives. But such training should be standardized by regulation and checked by examination. And it is essential that health-visitors should receive similar training. It is only by teaching that we can obtain a national service of "sagacious women" trained in the art of breast-feeding. The key to the problem is the utilization of our maternity hospitals for this training.

Meantime, the propaganda value of Dr. Spence's clear, wise, and witty paper is very great. I suggest the Ministry of Health should place a copy in the hands of every midwife and health-visitor throughout the land.—I am, etc.,

Edinburgh, Oct. 16. CHARLES MCNEIL.

SIR,—As a fanatic on breast-feeding I was much interested in the article by Dr. J. C. Spence. I agree with him that the vast majority of failures are due to mismanagement, and for this the medical and nursing professions are largely to blame. There are still far too many doctors who take no interest in the baby's food and far too many nurses who fly to a bottle at the first difficulty. Given adequate supervision during the first fortnight of the puerperium the average mother finds most difficulty when she starts to take up her multitudinous household duties. It is then that the vicious circle starts: insufficient milk → crying hungry child → sleepless mother, father, and neighbours → anxious tired mother → further decrease of breast milk. If expert advice is not obtained immediately artificial feeding is started. It is at this time that the advice of the family doctor should be most helpful. The mother is often not sufficiently fit to push the pram to a welfare centre, and by the time she does so the breast milk may be completely lost. Once lost, it is difficult to get it back without complete hospitalization, which is nearly always impracticable. A little helpful advice and encouragement during the second fortnight of the puerperium will often reverse the vicious circle, and the milk supply increases rapidly.

Ten years ago I avoided resorting to bottles at all costs, but now I find that the results are better if a little judicious complementary feeding is allowed. The psychological effect of a contented and well-satisfied baby has an almost miraculous result on the supply of milk, which increases by leaps and bounds, so that the bottle is soon abandoned. The intense fatigue felt by the lactating mother at this stage can be successfully removed by large doses of iron.

I agree with Dr. Spence that it is a mistake to be too hidebound about times of feeding. An occasional night feed is better than a sleepless household, but if the child's sense of psychological security is not disturbed by maternal anxiety regular feeding soon becomes automatic.

I do not consider test-feeding as over-mechanization if used with common sense. I have several complete records of test-feeds from birth to 9 months, and many for shorter periods. Intelligent mothers tell me, and I know from personal experience, that regular test-feeding often saves time, trouble, and anxiety. Calculating caloric values and ounces per pound is also useful as a general working basis, but it must be remembered that all these rules are made to be broken in individual cases. Highly trained maternity nurses often do not realize this, and impose far too rigid a routine. In looking through 100 consecutive cases from my records I find that 82 per cent. of mothers breast-feed their babies for over three months and 70 per cent. for over six months, when extra foods are gradually introduced, and complete weaning takes place at nine to ten months.

I am convinced that if only a more active interest were taken in the subject by the medical profession the percentage of breast-fed babies would greatly increase.—I am, etc.,

Chippenham, Wilts, Oct. 10. JOAN F. HICKSON.

SIR,—Commenting on the very stimulating paper by Dr. J. C. Spence on the modern decline in breast-feeding, may I make one or two suggestions.

New Zealand, I think, is still far ahead of this country in the advocacy of breast-feeding. Twenty-five years ago or more the Plunket Society (now known as the Royal N.Z. Society for the Health of Women and Children) taught the fundamental importance of breast-feeding to the well-being of both infant and mother. The late Sir Frederick Truby King, founder and director of that organization, emphasized that breast-feeding, at any rate during the earlier post-partum period, stimulated the physiological contraction of the uterus. May it not be that failure to maintain breast-feeding is one of the causes of subinvolution and subsequent malposition of a flabby uterus? It is at least logical to expect that it has some reflex relationship to the involutionary changes in the pelvis that follow on the termination of pregnancy.

Again, Truby King also taught with great success that one of the most potent factors in maintaining an adequate supply of breast milk was the *complete* emptying of the breast at each feed; and for this reason he advocated feeding the baby at one breast only at one feed, and at the other breast at the next feed. It was the complete emptying rather than frequent suckling that was the effective factor; and to ensure complete emptying of the breast the infant must not be fed too often. King also taught the importance of sufficient fluid being taken by the mother.

May I pay a tribute here to Sir Frederick Truby King, who worked most of his life in New Zealand for the better health of women and children, often against bitter opposition and apathy. Nothing would have better pleased him than to read Dr. Spence's paper in the *B.M.J.*—I am, etc.,

Birmingham, Oct. 12. E. H. WILKINS, M.B., D.P.H.

"Ether Convulsions"

SIR,—We have read the case reports of Dr. S. Taylor and Dr. V. Goldman and the interpretation they place on them (*Journal*, October 8, p. 744). We are of the opinion that the factor of CO_2 accumulation, which they have not considered, is a vital one.

Very little attention has been paid to the valuable observations of Dr. K. B. Pinson, who has reported the largest series of these cases, and we believe it well worth while to bring to light again some extracts from his original paper (*British Medical Journal*, 1927, **1**, 956).

" . . . I have come to regard the convulsion as largely the outcome of the extensive action of the CO_2 in patients who are sensitive to this naturally, or by reason of toxaemia, pyrexia, and so on. . . . Treatment based on this assumption has so far been successful. It is directed to the riddance of excess CO_2, and must be prompt. Luckily some moments' warning is given of the impending seizure by twitching of the eyelids and mouth, jerkiness of the breathing, especially inspiration, or some strange movement or sound, and so the essential thing can be accomplished—the immediate removal of all coverings from the face before the convulsions have set in. . . . Any obstruction must be completely relieved. . . . In this way the CO_2 will diminish as much as possible by natural means."

It is also a little disappointing to realize that the experiment in which one of us (M. D. N.) was half killed by the other was made to no purpose. In this experiment (*British Medical Journal*, 1937, **2**, 995) the subject inhaled an 80/20 per cent. helium–oxygen mixture to which CO_2 and oxygen were continuously added (the helium being used to diminish exhaustion caused by the hyperpnoea). Muscular twitchings were first noticed about the eyes, and these passed on to generalized convulsions, which subsided after a few breaths of air.

In fit normal subjects low concentrations of CO_2 have a stimulating action, and it may not be until a 10 per cent. concentration is exceeded that toxic effects become obvious. The susceptibility of different people to CO_2, however, varies considerably, and a concentration which is stimulating for a time to one person may be toxic to another—as shown by respiratory and circulatory depression as well as by muscular spasms.

We now suggest that the following sequence of events occurs in the vast majority of cases of convulsions during anaesthesia. The usual type of patient is a toxic individual who is already acidotic. Then follows some further increase in CO_2, caused by the addition of that gas, by the use of rebreathing, by the presence of respiratory obstruction, or by the decreased pulmonary ventilation of deep anaesthesia or other abnormal condition. No matter by what means the CO_2 is raised, a toxic concentration is reached in that particular individual, and this precipitates the convulsions. Respiratory obstruction, if evident in such a case, has in our experience been followed by shallow jerky breathing and not by the hyperpnoea postulated by Drs. Taylor and Goldman.

The anti-convulsant properties of the barbiturates are well known, but our aim should be to prevent the onset of convulsions. Some factors, such as the type of patient, are obviously beyond our control, but every effort should be made to eliminate the one factor which *is* under our control—namely, a CO_2 pile-up. If in spite of all precautions muscular twitchings are observed, Dr. Pinson's advice should be followed and every effort made to lower the alveolar CO_2 before injecting a barbiturate.

We feel that the term "ether" convulsions is a misnomer; if Drs. Taylor and Goldman still doubt that excess CO_2 is an aetiological factor, we will do our best to produce convulsions by means of CO_2 in either of them, while the other acts as observer. As presumably neither of them is acidotic, a relatively high concentration will probably be necessary, and we can offer no guarantee that more than one of them will live to tell the tale.—We are, etc.,

M. D. Nosworthy.
R. F. Woolmer.

London, Oct. 11.

Sir,—The "provisional theory" offered by Drs. S. Taylor and V. Goldman in the *Journal* of October 8 (p. 744) is an over-simplification not justified by the facts. These authors suggest that an essential element in the production of ether convulsions is alkalaemia resulting from the loss of CO_2. This is not a new suggestion, and it has less to commend it than its opposite—namely, that ether convulsions are caused or precipitated, other factors being appropriate, or by the accumulation of CO_2.

At a recent "anaesthesia staff meeting" at Wisconsin Waters[1] stated that "convulsions during anaesthesia have been, in well over 90 per cent. of the cases, connected with an excess of CO_2 in the respired atmosphere." The same meeting discussed two cases of ether convulsions occurring in patients in whom acidosis had been produced by the administration of ammonium mandelate. They were successfully treated by intravenous injection of alkali. It may be significant that the majority of cases occur under conditions in which there may be defective removal of CO_2 from the respired gases, whilst the concentration of oxygen is maintained at a high level. Campbell[2] showed in 1925 that the CO_2 content of the tissues is greatly increased by breathing an atmosphere containing as little as 40 per cent. oxygen.

According to Campbell,[3] the respiring of oxygen at several atmospheres' pressure may lead to convulsions because oxyhaemoglobin is not reduced, sufficient oxygen for the needs of the tissues being carried in the plasma under these conditions. Oxyhaemoglobin assists the removal of CO_2 from the tissues less efficiently than does reduced haemoglobin; the CO_2 pressure within the cells rises and convulsions follow. In view of the strong correlation between CO_2 excess and ether convulsions it is possible that some rather similar mechanism will account for the occurrence of this grave emergency. Any combination of factors leading to a disturbance of the acid-base balance of the blood towards the acid side may prepare conditions for what Waters refers to as the "so-called trigger effect of CO_2" in inducing a convulsive seizure.

It should be remembered, however, that though strongly suggested by clinical observations, the "CO_2-excess hypothesis" has very little more exact experimental evidence than the "CO_2-lack hypothesis." Lundy[4] gives a list of thirty-three aetiological factors which have been invoked in the literature, some of them mutually exclusive. The only prospect of disentangling the confusion which has arisen lies not in the championing of rival hypotheses but in the provision of a body of experimental data which can be analysed in the usual inductive manner.—I am, etc.,

C. L. G. Pratt.

Oxford, Oct. 11.

References

[1] *Curr. Res. Anaesth. & Analges.*, 1938, **17**, 277.
[2] *J. Physiol.*, 1925, **60**, 20.
[3] Ibid., 1929, **68**, 7.
[4] *Surgery*, 1937, **1**, 666.

A Strict Vegetarian Diet

Sir,—May I repeat the statement made in my paper (August 20, p. 417) that the determinations of total nitrogen and urea were made for me by a chemical pathologist of distinction, that two samples were collected at intervals of some weeks and the results closely agreed, and that the pathologist, in his own experience, had not come across a lower total nitrogen value.

The oxygen consumption of the boy indicated a calorie value of the diet bigger than that reported, and I have told the father that his diet records are not believed; but I have not been able to shake the evidences either of the boy or of his father, a man of high character, who welcomes further scientific observation at his home.—I am, etc.,

Leonard Hill.

St. John Clinic, S.W.1, Oct. 10.

Adult Scurvy

SIR,—I should like to make a brief comment on a case of adult scurvy described by Dr. G. H. Jennings and Surgeon Lieutenant A. J. Glazebrock in the *Journal* of October 15 (p. 784), since I feel the impression given is slightly misleading. The report on the bone marrow quoted is that sent to the ward at the time of the patient's admission; since then I have had the opportunity of examining marrow films from a large number of cases of Addisonian pernicious anaemia. The primary erythroblasts in the case described are much more mature than those seen characteristically in pernicious anaemia. I would no longer say that the film was compatible with such a diagnosis. In fact it is now used for teaching purposes as an example of megalocytic anaemia where the marrow picture should have enabled us to state that the case was definitely not one of the Addisonian type.

I can only regret that my ignorance in the first place may have confused the issue.—I am, etc.,

London, W., Oct. 17. JANET M. VAUGHAN.

Aperients and Sulphanilamide

SIR,—In your issue of June 25 (p. 1392) a letter from Dr. Harry Roberts appears concerning the administration of sulphanilamide with saline aperients. As it is generally believed that the concomitant administration of sulphur-containing purgative drugs, such as magnesium sulphate, with the drugs of the sulphamido group is not devoid of danger, I feel that the following case would be of particular interest as magnesium sulphate was given continuously with maximum doses of carboxy-sulphamido-chrysoidine (rubiazol) over a period of ten days without any toxic manifestations occurring.

A boy of 8 years was admitted to Wimbledon Hospital on September 7, 1938, his mother having noticed discoloration of the urine and oedema of the face for four days.

On examination the child was found to have enlarged tonsils (he had suffered from an attack of tonsillitis three weeks previously); there was slight oedema of the face; and his blood pressure was 150/90. The physical signs in the chest were diffuse tubular breathing, rhonchi, and crepitations. Pathological findings were as follows: The urine was acid and contained 6 per cent. of albumin (Esbach), many pus cells and red cells, and casts. Culture gave a strong growth of *B. coli* and enterococci. A throat swab showed a mixed culture of *Strep. viridans* and *Staph. aureus*. The blood culture was sterile. The blood urea was 46 mg. per cent.

He was nursed on the balcony during the day-time, sitting up in bed. Fluids were restricted to 1¾ pints of glucose and orangeade per day. An electric pad was applied to his loins and the following drugs were given: pot. cit., 20 grains four-hourly; mag. sulph., 1 drachm, mane; linctus sedativus, 1 drachm, nocte; mist. ammon. carb., 1 drachm three times daily. On the second night he was very restless and "chesty," and his temperature rose to 103.6° F. and his respirations to 40 a minute. At 10 p.m. he had a rigor. Two tablets of rubiazol were given at once and he was put on one tablet (3 grains) four-hourly. The next evening his temperature was 102° F., but his respiration rate rose to 60 a minute. Continuous nasal oxygen was given throughout the night. The following evening, although his temperature was still up to 103° F., he was very much better and respirations were quite easy—30 a minute. His temperature became normal within five days. The oedema of face had disappeared. Each day his urine was tested and the percentage of albumin steadily diminished, as also did the pus cells and red cells. The volume passed was about 13 ounces in twenty-four hours. All this time his skin was acting well and his bowels opened regularly each day with half a drachm of magnesium sulphate in the mornings.

On the tenth day there was a faint trace of albumin in the urine, but no red cells or pus cells. Culture was sterile. There was no oedema, and the signs in the chest were very slight. All drugs were stopped, including rubiazol. He was started on a light diet (excluding meat, eggs, and cheese) with as much fluids as he could drink. A good diuresis was produced. Fluid intake was measured against the urinary output for a few days—for example:

11th day:	fluid intake	50	ounces,	urinary output	14	ounces		
12th "	"	"	35	"	"	"	17	"
13th "	"	"	40	"	"	"	34	"
14th "	"	"	37	"	"	"	29	"

He was allowed up on the fifteenth day of his illness and made an uneventful recovery.

It is clear that in the above case a considerable amount of magnesium sulphate was administered at the same time as full doses of carboxy-sulphamido-chrysoidine, resulting in complete recovery without any signs of toxicity occurring at any time. Although the mechanism of the action of the drugs of the sulphamido group is not at present fully explained, it would appear that the action of the red compounds (such as carboxy-sulphamido-chrysoidine) in the organism is quite different from the white substances (para-amino-benzenesulphonamide). It has previously been shown by Young, Snodgrass, and Anderson that the red substances are less toxic than the white, but so far as I am aware this is the first case reported where a sulphur-containing compound has been administered with a sulphanilamide product without any toxic signs being observed.

It would be interesting to hear of any similar cases, as clearly one case of this nature proves nothing in itself. I have to thank Dr. E. B. Rayner for permission to publish this report.—I am, etc.,

London, S.E.1, Oct. 7. PHILIP GRIMALDI.

Overdosage of Prominal

SIR,—In view of the absence of clinical reports concerning prominal poisoning I have thought it advisable to record the following case. (Prominal is *N*-methylethyl-phenylmalonylurea.)

The patient, a married woman of 29 who had suffered from epilepsy since the age of 18, had been taking three or four prominal tablets a day for some years, the fits on this dosage occurring once or twice weekly. On September 5, 1938, after obtaining possession of a box containing fifty 3-grain tablets, she settled down in bed with a novel and swallowed the tablets one after the other until the box was emptied. Although it was certain that she had swallowed this number I was not called to see her until September 10, five days later; she was then in a semi-stuporous condition. When spoken to sharply in a loud voice she replied in a vague way; her breathing was very shallow, her colour was good, and her pulse and temperature normal. Her pupils were rather large and reacted slowly to light. This condition slowly disappeared, and by September 16—that is, eleven days after the ingestion of the drug—the patient was normal. Her relatives assured me that she had missed no meals, and that her hours of sleeping and waking had not been altered. In addition she had been given her usual aperient each night, and had been sufficiently conscious to be supported to the bathroom daily, although she had been unable to attend to her toilet. An interesting point in connexion with this case is that the patient developed a slight attack on the morning of the eleventh day, and that during that period she would have taken almost as many tablets as she consumed in the single dose. On the twelfth day she had two attacks; she then resumed her usual dose, and twenty-four days after recommencing the prominal she had not had an attack.

I have been unable to find a report of a similar case of overdosage with prominal, but it is of interest to compare this with the case of luminal poisoning reported

by J. P. Stewart and W. Willcox (*Lancet*, 1934, **1**, 502), in which recovery occurred after the ingestion of 100 grains of luminal, although the symptoms were much more severe than those displayed by my patient. The toxicity of prominal is stated by the makers to be 30 per cent. lower than that of luminal. This case illustrates very clearly the strong sedative effect without the hypnotic action.—I am, etc.,

Blackburn, Lancs, Oct. 9. D. Kelleher.

Palpation of the Trachea

Sir,—Although it is obvious that determination of the position of the trachea in the lower part of the neck only justifies a surmise as to the position of the upper mediastinum, more and more attention has been paid to this physical sign in recent years. Hence I make bold to describe the following method, which I have found very useful in eliciting the physical sign and in demonstrating it to students.

The observer's thumb is placed on the patient's neck as low down as possible between the sternal head of the right sterno-cleido-mastoid muscle and the trachea, while the fingers are placed on the belly of the clavicular head of the left sterno-cleido-mastoid just above the clavicle. An attempt is then made to grasp the trachea between the finger and thumb without displacing the structures of the neck. The same thing is then attempted on the other side, this time with the fingers on the trachea between it and the left sterno-cleido-mastoid and the thumb on the belly of the right sterno-cleido-mastoid. If, as is usual, the trachea lies in the midline, then it is impossible to grasp this organ without grossly displacing the structures of the neck by either grip, but the slightest displacement to either side brings the trachea under the belly of the sterno-cleido-mastoid on that side and allows the former to be easily felt by the grip described above.

—I am, etc.,

G. Joly Dixon,
Medical Registrar, Charing Cross Hospital.

London, W.C.2, Oct. 6.

Treatment of Infections of the Hand

Sir,—I have read with interest Mr. Norman Lake's three articles on infections of the hand in your issues of October 1, October 8, and October 15, and must confess to some sense of disappointment as each succeeding instalment failed to reveal a rational treatment. Some reference was made to arm baths: I had hoped it would be a condemnatory reference, but it seems that soakage in aqueous solutions is still to be tolerated, with its sequelae of unhealthy, swollen, drainage-damming granulations; secondary infection; and subsequent stiffness.

No mention is made of the virtue of infrequent dressing on the Winnet-Orr principle: that is, after adequate incision a large quantity of vaseline is applied on gauze and the dressing left for five to seven days. With this treatment artificial drainage, which Mr. Lake rightly condemns, is unnecessary. The advantages of this method are numerous:

1. The dressing can be painlessly removed without disturbing healthy granulations.

2. Vaseline is, biologically speaking, non-nutrient to bacteria, as it cannot be broken down and does not form a suitable medium for their growth; it also forms a physical barrier to their entry; any bacteria in the wound can be dealt with by tissue defence.

3. Movement short of pain is always encouraged. This promotes a flow of discharge into the vaseline which prevents crust formation, and return to normal is accelerated. Rigid splints are unnecessary.

4. The hospitals whose out-patient departments favour the vaseline treatment of hand sepsis can show a *nil* return for such cases admitted to the wards; the reverse is the rule in "arm-bath" clinics.

5. Economy of out-patient staff time and hospital material.

6. Patient returned to work with a useful hand in minimum time.

7. Re-education in physical treatment departments is hardly ever necessary.

8. And greatest of all—an economy in pain.

—I am, etc.,

Longtown, Cumberland, Oct. 15. R. Rutherford.

Diagnosis of Whooping-cough

Sir,—In reply to Dr. A. Gordon Moore's letter (*Journal*, October 1, p. 722), in which he regrets that I was only able to devote a few lines to agglutination tests as a diagnostic aid in whooping-cough, may I enlarge on my findings.

Agglutinins were first demonstrated by Bordet and Gengou in 1907, but they were very guarded in their conclusions and stated that the power of agglutination in convalescent sera was very weak, having found that many sera giving a strong complement-fixation test had practically no agglutinating power; and they believed that the bacilli become so modified when grown on artificial medium that they are incapable of reacting with convalescent sera. In view of this all strains used in my tests were grown for twenty-four or forty-eight hours on Bordet medium containing 50 per cent. horse blood, which maintains the *Haemophilus pertussis* in its smooth phase.

An effort was made to demonstrate agglutinins in the blood of cases of whooping-cough from the second week onwards, but with one exception all were completely negative. The one successful case agglutinated to a titre of 1/128 in two hours' time in two series of dilutions, one of which was placed in a water-bath at 56° C. and the other in the incubator at 37° C. This serum was from a patient in the eighth week of illness, and the complement-fixation test was strongly positive. Various other sera giving positive complement-fixation tests were put up at the same time in duplicate, as above, using the same strain of bacillus, but results were completely negative. The dilution of organisms in all cases was approximately 2,000 million per c.cm. In all, fifty different sera were tested, most of which gave strongly positive complement-fixation tests, and as they all failed to show agglutination at any time during twenty-four hours the conclusion come to was that the agglutination test was unreliable and useless as a method of diagnosis.

—I am, etc.,

Edinburgh, Oct. 10. A. B. Donald.

Tomography in the Vertical Position

Sir,—Drs. J. B. McDougall and J. H. Crawford, who in their paper on tomography (*Journal*, October 15, p. 782) were kind enough to refer to my work, stated that *it is claimed* (my italics) that by vertical tomography the upper limit of a pleural effusion or the line of a fluid level in a cavity is not obliterated. It would have been more correct to have said that by working in the vertical position fluid levels can unquestionably be shown whenever fluid is present. Such has been my experience in every case of this type that I have examined. Surely the limitation of the original apparatus devised was the only excuse for departing from the more usual practice of

radiographing the chest and other air-containing cavities such as the nasal sinuses in the upright position. The obvious advantages of the vertical technique hold for tomography no less than for simple radiography.—I am, etc.,

Croydon, Oct. 17. CHARLES COLYER.

Admission of Foreign Doctors

SIR,—In the debate on Government foreign policy last night Mr. Richard Acland, member for Barnstaple, made the following pronouncement (*Hansard*, October 5, col. 389):

"I would ask the doctors of this country, who were rather forward in pressing hon. members of this House to forbid the influx even of as few as fifty alien doctors per year, to remember that while they can pursue their practice in peace many of their fellow combatants in the battle of humanity against disease will be driven into bankruptcy and into suicide in Prague, and I invite them or the Government to suggest a scheme whereby this country might take in 500 doctors a year from Czechoslovakia; not necessarily to enter private practice, but to try to find some research work which they can do here for the sake of humanity."

It being the last night of the special session dealing with the international crisis the House was crowded beyond precedent and I could find a seat only behind the bar, which while actually within the Chamber is technically outside for purposes of debate; consequently I was unable to make any protest, and the proposition passed unchallenged.

The specious pretext that a large number of foreign doctors could be advantageously admitted to this country, "not necessarily to enter private practice but to try to find some research work," has been used again and again and ought, I think, to be definitely debunked. The great majority of the proposed annual entry of 500 Czech doctors would be persons of middle or mature age without any previous experience of research, and to claim that they could forthwith embark upon that most difficult branch of medical work in an alien country with an alien language in a peculiarly alien atmosphere is surely the purest claptrap. Mr. Acland is a barrister, and in the earlier part of his speech he mentioned that lawyers as well as doctors are being persecuted in Prague, but there was no suggestion in his speech that the legal profession in this country should open their doors to their harassed colleagues in Prague.

In an answer to a Parliamentary question (*Hansard*, March 7, 1938) it was stated that "during the year 1937 extensions of stay in this country were granted in 813 cases of professional men and women who had arrived during the last three or four years," of whom 181 were doctors, 66 dentists, and only 12 lawyers! Nearly "300 research workers," whose occupation was not otherwise specified, were retained. The medical profession ought not to be, and in fact is not, indifferent to the ghastly sufferings of so many of our professional brethren in Central Europe, but serious thought should be given to the practicability of the remedies proposed to relieve them. Some two months ago I asked a question in the House (*Hansard*, July 25, cols. 2734 and 2745) worded as follows:

"Whether the Secretary of State for the Colonies is aware that, whereas the number of persons per qualified doctor in Great Britain is approximately 1,000, in some parts of the British Colonies (to be carefully distinguished from the Dominions) the proportion is as high as 100,000; and whether, in these circumstances, he has under consideration any plans for increasing the personnel of the Colonial Medical Service." And I suggested that it was in this field that medical refugees from Central Europe might find sanctuary.

For some years now I have been interested in the medical conditions prevailing in East Africa, and I have received a large mass of information, based upon authoritative local knowledge, which indicates that there is a crying need for qualified medical practitioners in that vast area of the British rule. The refugees would be called upon to practise medicine, for which their experience would obviously fit them better than to undertake research. The Colonial Secretary's answer was entirely discouraging, but surely mine is a more promising solution than that proposed by Mr. Acland.—I am, etc.,

House of Commons, Oct. 6. E. GRAHAM-LITTLE.

Obituary

JOSEPH POWER, M.B.

Late Chairman of the Irish Medical Committee

The death of Dr. Joseph Power, formerly medical officer of the Ardfinnan dispensary district, Co. Tipperary, occurred after a long and painful illness at his residence, Knockaun House, Cappagh, Co. Waterford, on September 25. He was 69 years of age. Born near Dungarvan, Co. Waterford, and educated at Rockwell College, Cashel, and Trinity College, Dublin, Power qualified as M.B., B.Ch., and B.A.O. of Dublin University in 1893. During his course in Trinity College he won a Stewart Scholarship in Anatomy and Institutes of Medicine, and he also gained repute as an athlete. He practised for a short time in Dungarvan, and in the East End of London, before being appointed to the dispensary district of Ardfinnan, where the rest of his professional life was spent. He retired from practice on account of ill-health some five years ago, and devoted his time to farming, in which he had always been much interested.

Power was a capable and conscientious country doctor, but his interests were never bounded by his purely professional duties. In particular he was interested in medico-political affairs, and was an active worker in the British Medical Association, of which he had been a member for thirty years. He was chosen as one of its representatives on the Conjoint Committee of the British Medical Association and the Irish Medical Association, which was formed in 1911 to deal with problems connected with national health insurance. In the business of that committee and of its successor, the Irish Medical Committee, he made his mark as one of the most practical and clear-minded members. In 1915 he was elected vice-chairman of the Irish Medical Committee, and in 1922, on the separation of Northern Ireland from the Irish Free State, he became chairman. He retained this position until the dissolution of the committee some three years ago. As chairman he conducted the business briskly, fairly, and firmly. He kept the essential points before a meeting, and was stern in preventing any wandering into non-essentials. He showed the same qualities when acting as spokesman for the profession in interviews with Ministers or Government Departments, and while he was uncompromising on matters of principle his sense of fairness rendered him accommodating in matters of detail. It was mainly due to his activities in association with those of the late Dr. Thomas Hennessy, Irish Medical Secretary of the British Medical Association, that the present system of certification of insured persons was agreed on with the Insurance Commissioners. He was president of the South-Eastern of Ireland Branch of the British Medical Association in 1912, deputy representative in the Representative Body

from 1913 to 1918, and representative in 1919, 1920, and 1921. He was a member of the Irish Committee from 1923 to 1934.

Dr. Power had a great love of country life and its occupations and pastimes—farming, shooting, fishing—and his knowledge of botany and the wild life of the fields made him a delightful companion on a country walk. He was widely read in general literature, and his comments on men and affairs were shrewd and entertaining. An upright and honourable man, and a good friend, he was trusted and respected both by his fellow-practitioners and by his patients, and to both he performed his duty in full measure. He is survived by his wife, three daughters, and two sons, of whom one is a member of the medical profession.

J. STODDART BARR, M.B., F.R.A.C.S.

Dr. John Stoddart Barr, who had only comparatively recently returned to Scotland after long residence in Hobart, Tasmania, died suddenly at Troon, Ayrshire, on September 14. He was born in Glasgow in 1878, the second son of the eminent aurist, Dr. Thomas Barr—a former lecturer in otology at the University—and began his medical studies at Glasgow University in 1896. In 1901 he graduated M.B., Ch.B., and became house-physician to Dr. James Finlayson, and, later, house-surgeon to Sir Hector C. Cameron in the Western Infirmary, Glasgow. He had decided, early in his career, to devote himself to the practice of diseases of the ear, nose, and throat, and with that end in view spent a year in postgraduate work in Vienna, afterwards studying in Zürich and London, and with Sir William Milligan in Manchester. In 1905 he was appointed assistant surgeon to the Glasgow Ear, Nose, and Throat Hospital, and in 1908 assistant dispensary surgeon for diseases of the ear to the Western Infirmary, Glasgow. In 1912 he developed a grave illness, which resulted in the following year in the loss of a lower limb and subsequent minor operations. His long convalescence was spent in the South of France and Cornwall. Finally, he decided for health's sake to make his home in Hobart.

Before leaving for Tasmania a high medical authority had strongly counselled him never again to engage in practice. Barr, however, was built in heroic mould and was not one to yield to the buffetings of fate without a struggle; soon after settling in Hobart he resumed his work and built up a considerable practice. In 1927 he became a Fellow of the Royal Australasian College of Surgeons. At the Annual Meeting of the British Medical Association in Belfast in 1909 he was Secretary of the Section of Laryngology, and a Vice-President of that Section at the Annual Meeting in Melbourne in 1935. When on a visit to this country he was the bearer of the mallet from the Tasmanian Branch when the new B.M.A. House, Tavistock Square, was opened in 1925. He was joint-author of the sections on diseases of the ear and throat in Choyce's *System of Surgery* (1913), and of the *Manual of Diseases of the Ear* (fourth edition, 1909). For a short time he held the rank of captain in the R.A.M.C.T. His death came as a surprise and great shock to his family and friends; indeed, he had intended to leave shortly for Cyprus, with the possibility of residing there.

A former colleague writes:

Barr's tragic ordeal, occurring in his early and such vital years, cruelly restricted his career. He was a skilful and confident operator, the outcome of natural endowments of a high order coupled with careful and assiduous training. Investigation appealed to him. I well remember associating with him at the outset of his career when he made certain experimental researches on the cadaver. It is not improbable that he would have engaged in further research but for the incidence of his grave illness. For one of Barr's athletic tendency—he had been a golfer, tennis-player, swimmer, and skater—his affliction must have been extremely hard to bear, yet I never once heard him complain. He was a man of fine feelings, eminently sympathetic to the poor and oppressed, a whole-hearted champion of liberty, a staunch and loyal friend; possessed of a singular charm of manner with a keen sense of humour, he radiated good fellowship and shone in the social circle. Barr did not neglect the cultural side of life; he was interested in zoology, and was a lover of pictures, exceptionally fond of verse, and the possessor of a well-trained baritone voice. To his intimate circle he has left a heroic example of unshakable optimism, stout endurance, and persistent endeavour in the face of a tragic happening which none but one possessed of the finest qualities of heart and mind could hope to bequeath.

THE LATE ALEXANDER MACPHAIL

Sir Weldon Dalrymple-Champneys, Bt., writes:

May I be permitted as an old friend and colleague of the late Professor Alexander Macphail to add a short appreciation to the obituary notice in your issue of September 10. I first met Macphail in 1912, when he had just become lecturer in anatomy at St. Bartholomew's Hospital and I had not yet begun studying medicine, but it was not until 1929 that I came to know him well. In that year I began to share a room with him in the Ministry of Health, and continued to do so until his death. A more delightful colleague and companion cannot be imagined. In him I found that rare combination of refinement and gentleness with moral courage and on occasion righteous indignation, the whole illumined by a strong sense of humour. His religion was real and deep but never obtrusive, and it was impossible to imagine him doing anything which savoured in the least of meanness or self-seeking. From his father, the well-known Gaelic poet of Mull, he had inherited a love of nature and artistic talents, which showed themselves chiefly in the delightful watercolours, some of which he showed every year at the Ministry of Health's Art Exhibition. For some years he had suffered greatly from attacks of bronchitis, which became more and more frequent, necessitating weary periods in bed, but he was always cheerful and uncomplaining and far more interested in other people's troubles than in his own. His death leaves a real gap in the lives of all who knew him well and to whom he was the personification of a Christian gentleman.

Universities and Colleges

UNIVERSITY OF OXFORD

The following medical degrees were conferred at a Congregation held on October 13:

D.M.—H. S. Brodribb.
B.M.—A. W. Frankland.

The Nuffield Foundation

A year ago Lord Nuffield, in addition to his previous endowment of two millions for the widening of the scope of the medical school at Oxford, gave a further £200,000 for the erection of buildings at hospitals associated with the medical research scheme. In his oration (which was a valedictory,

after three years of office) in Convocation on October 5 the retiring Vice-Chancellor, Mr. A. D. Lindsay, stated that out of this fund there had so far been expended some £75,000 on buildings completed or in construction—principally new surgical and gynaecological wards at Radcliffe Infirmary and maternity home extensions, which absorbed over £60,000, also on an extension of the pay-bed block and *x*-ray theatre.

The last of the four basic clinical professorships in the Nuffield medical school, as already announced, has been filled by the appointment of Professor L. J. Witts as professor of clinical medicine, and the Vice-Chancellor stated that all the clinical professors are now working full time in their departments. He warned any who might cherish such an expectation that it must not be supposed that sensational discoveries would rapidly ensue or, indeed, should be sought. The vast machine of research must first be welded into a unity. This process, he said, was going apace, and had been helped during the year by the creation of a fluid research fund from which would be financed those promising research projects which emerged from time to time, now in one department and now in another. Such projects, born of happy inspiration or lucky accident, could not be foreseen or provided for in the routine departmental budgets, and so the fund would be open equally to all departments of the school.

Another Oxford development, again made possible by Lord Nuffield, is the foundation of three clinical assistantships tenable in the clinical departments of the medical school and three demonstratorships in the pre-clinical departments by graduates of universities in Australia, New Zealand, and South Africa. The tenure of each post is three years, after which the holders will be expected to return to teaching or research posts in the Dominions. The idea is that Dominions remote from the great centres of research will be enabled to participate in the work of the Oxford school. Provision is also made for the appointment at frequent intervals of a visiting professor to tour the Dominions with a view to giving and receiving information.

A tribute was paid by the Vice-Chancellor to Dr. Simon Flexner, whose appointment as George Eastman Visiting Professor has just terminated. His presence in Oxford, said Mr. Lindsay, had been of incalculable advantage to the medical school. His accessibility and his powers of lucid exposition endowed the new school at its birth with the benefits of the experience of a lifetime devoted to similar research.

New Physiology Laboratory

Among other developments at Oxford mentioned by the Vice-Chancellor is the planning of a new physiology laboratory to replace the present building, which was erected more than fifty years ago. Hitherto the state of overcrowding in a building intended to accommodate forty students and having to provide for four or five times that number has entailed the repetition of many lectures and demonstrations. The new laboratory will include library and common rooms to be shared by the department of biochemistry, and will cost £120,000.

A second May readership in medicine has been established on a temporary basis for three years, and has been filled by the appointment of a reader who will help to bridge the gap in the teaching of physiology and clinical medicine by conducting an extended course in general pathology. The tenure of Dr. A. M. Cooke, who was appointed May reader in 1933, has been extended for a similar period, and when the two readerships become vacant simultaneously in 1941 the whole position will be reconsidered.

UNIVERSITY OF CAMBRIDGE

At a Congregation on October 15 the following medical degrees were conferred:

M.D.—*C. G. Parsons, *H. Smith.

M.B., B.CHIR.—*C. W. Hutt, *K. W. Donald, T. A. W. Edwards, W. E. D. Moore, J. S. Heller, G. M. Little, J. P. Henry, E. A. Evans, A. G. Marshall.

M.B.—J. A. Falk.

B.CHIR.—C. H. M. Gimlette.

* By proxy.

Pinsent-Darwin Studentship in Mental Pathology

The managers give notice that an election to the above studentship will be made in January, 1939. The studentship is of the annual value of not less than £225, and is tenable for three years. The student must engage in original research into any problem having a bearing on mental defects, diseases, or disorders, but may carry on educational or other work concurrently. Applications for appointment to the studentship should be sent before December 1 to the secretary, Pinsent-Darwin Studentship, Psychological Laboratory, Cambridge. Applicants should state their age and qualifications and the general nature of the research that they wish to undertake. No testimonials are required, but applicants should give the names of not more than three referees.

The following candidates have been approved at the examination indicated:

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.—*Part II:* G. Q. Chance, W. J. Craig, T. Fichardt, R. L. Mansi, A. M. Mansour, C. G. Talwalkar.

UNIVERSITY OF SHEFFIELD

The following candidates have been approved at the examination indicated:

FINAL M.B., CH.B.—*Parts II and III:* J. Beech, E. G. Crookes, N. W. Jones, J. S. Lindsay, W. J. Wilson.

UNIVERSITY OF GLASGOW

At a Congregation held on October 15 the following degrees were conferred:

M.D.—*J. I. Russell, †C. Glen, †I. MacKay.

M.B., CH.B.—‡J. Walker, †N. G. B. McLetchie, †A. Brown, †Elizabeth B. S. Scobbie, †T. Gibson, †Janet R. Mowat, †R. T. S. Gunn, †A. Macfarlane, W. C. Alford, H. M. Archibald, G. W. Armour, W. Auld, W. Bain, Margaret R. Barr, G. D. S. Beechey, A. M. Brannan, J. Brown, Margaret A. F. Burton, D. C. Caldwell, C. Cameron, D. Christison, J. Y. Clark, Marion A. Crawford, R. C. Cunningham, Margaret M. B. Curley, Ellen Cush, I. MacK. Davidson, J. S. Dawson, E. C. Easson, Jay Fairweather, W. Ferguson, J. D. Frame, J. R. Gallie, J. Garden, J. L. Gilloran, J. Glen, M. Goldin, R. Good, T. T. Graham, A. Granat, Helen W. Greenlees, G. A. Guthrie, A. J. Haddow, A. R. Harper, L. G. Harper, A. W. Harrington, T. Hart, F. J. Hebbert, I. B. Hopkins, F. Iskander, A. S. Johnston, E. de C. Kite, Mary MacT. Leitch, J. B. McCallum, I. M. McCully, D. Macdonald, A. McDougall, J. D. McFadyen, Jean M. McGill, A. W. McHaffie, I. McIndewar, J. R. Macintyre, I. C. K. Mackenzie, H. McKeown, W. MacK. McLennan, Julia M. Middleton, W. Mullen, R. L. Orchardson, G. D. Park, Mary R. Paterson, D. Paton, R. Provan, A. J. G. Pullar, D. Purdie, C. McK. Ramage, R. Rankin, I. Rannie, A. G. Reid, J. Reid, R. V. Rhoda, J. H. Rosengard, Margaret C. G. Russell, G. H. Scoular, M. Shaw, D. R. Sloan, James Smith, John Smith, L. Steingold, J. H. Stirrat, W. B. Summers, Anna J. Sutherland, J. A. Sutherland, A. M. Tait, R. D. Taylor, Barbara S. Thomson, K. R. Thornton, W. V. Wallace, N. Watters, J. Wishart, Shanna B. Wright, D. Yellowlees, A. Young, I. M. Young.

B.Sc. (Pure Science).—Etheldreda Cadas, M.B., Ch.B.

* With high commendation. † With commendation. ‡ With honours.

James Walker gained the Brunton Memorial Prize, awarded to the most distinguished graduate in medicine for the year 1938.

The West of Scotland R.A.M.C. Memorial Prize was awarded to Janet R. Mowat and John F. B. Wyper (equal) as the candidates who obtained the highest aggregate marks in surgery, medicine, and midwifery in the final M.B., Ch.B. examinations held during 1938.

The Macewen Medal in Surgery was awarded to Alexander Macfarlane as the candidate who obtained the highest aggregate marks in surgery at the final M.B., Ch.B. examinations held during 1938.

The Stockman Medal was awarded to Elizabeth B. S. Scobbie as the candidate who obtained the highest aggregate of marks in the professional examinations in materia medica and therapeutics and medicine (written, oral, and clinical), excluding paediatrics, in 1938.

The Captain H. S. Ranken, V.C., Memorial Prize was awarded to James W. Chambers as the candidate who obtained the highest marks in pathology in the professional examinations in 1938.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

Professor J. B. S. Haldane, F.R.S., will deliver the 1938 Lloyd Roberts Lecture, on "Some Problems of Human Congenital Disease," at the College, Pall Mall East, S.W., on Thursday, November 17, at 5 p.m.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

A meeting of the Council of the Royal College of Surgeons of England was held on October 13 with the President, Mr. Hugh Lett, in the chair.

Mr. Frank Batley was admitted as a Macloghlin Scholar.

Sir Alfred Webb-Johnson stated that he had been asked by an anonymous donor to offer the College a gift of five hundred guineas for the completion of some special work. The Council accepted this munificent gift with very grateful thanks.

The Council stated that it was prepared to hold a Primary Examination for the Fellowship in Australasia every three years, the next examination to be in February, 1941.

The general annual report and the scientific report of the Council were approved.

It was reported that the office and secretariat of the Imperial Cancer Research Fund were now established at the College.

Counsel's opinion stating that the existing charters do not give the College power to grant a higher diploma in dental surgery was before the Council.

The Council accepted with grateful thanks a bust of John Whitaker Hulke, President in 1893 and 1894, presented by the Middlesex Hospital, and a bust of Thomas Wormald, President in 1865, presented by the Wormald family.

Diplomas

A Diploma of Fellowship was granted to Robert Officer.

Diplomas of Membership were granted to Phoebe Charlton, Abraham Caplin, and Hugh Stott.

Diplomas in Child Health were granted, jointly with the Royal College of Physicians of London, to the following candidates:

Khairunnisa B. Ahmed, A. M. Clark, J. H. Colebatch, S. D. M. Court, A. G. Denison, M. L. Edwards, Irene K. Falk, Mima M. Gemmell, S. M. Ghosal, K. N. Gour, Alice M. Headwards, R. S. Illingworth, F. D. M. Livingstone, S. Mackenzie, N. S. Mair, Queenie I. E. May, A. B. Milligan, Anasuya Mundle, Margaret I. Neal, M. N. Pai, Helen J. L. Robertson, A. T. Roden, A. V. S. Sarma, S. S. Sawaf, M. Seraj-ul-Haque, Florence Stephen, Shirley M. Taylor, Achamma Thomas, Mary A. Thomas, M. Trivedi, F. Walt, C. B. M. Warren, R. G. Wilbond, Elsa P. Woodrow.

The following hospital was recognized for the six months' surgical practice required for the Final Fellowship:

Harrogate and District General Hospital, house-surgeon, till July 31, 1939.

EPIDEMIOLOGICAL NOTES*

Acute Poliomyelitis

The progressive reduction in the incidence of acute poliomyelitis observed during the previous three weeks in England and Wales has not been maintained during the week under review, the notifications having risen from 56 to 65, and in London from 3 to 6. In Scotland notifications rose from 5 to 8. The counties mainly affected were: Essex 9 (4), Carmarthen 6 (4), Lancashire 5 (0), and 3 each in Kent (1), Sussex East (0), Sussex (4), Warwickshire (2), and Yorkshire East Riding (3). More than one case was reported from the following centres: London 6 (3)—in Battersea, Chelsea, Fulham, Greenwich, Kensington, and Stepney—Llandilo 4 (0), Tendring (Essex) 3 (0), and 2 each in Marple (0), Halstead (0), Lanbrook (0), Tamworth Urban (0), Tamworth Rural (0), Cuckfield (0), Llanelly (1), Swansea (0). In the two counties chiefly affected, Essex and Carmarthen, cases were notified in: Tendring 3, Halstead 2, and 1 each in Barking, Harwich, Ilford, and Dunmow; and in Carmarthen—Llandilo 4 and Llanelly 2. In the week under review, 1 (4) case was notified at Horsham.

The epidemic of acute poliomyelitis in Germany continues to decline: for the week ended September 24, 275 cases were recorded in the whole country, as against 386 in the previous week; the areas chiefly affected were: Cologne district 44 (88), Wiesbaden 23 (27), Düsseldorf 18 (19), Bavaria 55 (50), Württemberg 58 (55), Baden 17 (16), Saxony 33 (33), Austria 21 (18). On the other hand, an increase was noted in Holland for the week ended October 1, the notifications having risen to 44 (30). In the Province of South Holland there were 18 (8) cases, and 6 cases in the Province of North Holland. In Sweden during the first fortnight of September the numbers reported increased from 167 to 230, of which 85 were non-paralytic; the districts chiefly affected were: Jämtlands Rural 94, Jämtlands Urban 25, Kristianstads Province 23. During the same period there were 84 cases of acute poliomyelitis in Finland, of which 18 occurred at Helsinki.

Primary and Influenzal Pneumonia

Slight increases in the notifications of primary and influenzal pneumonia were observed in England and Wales and in London; an increased number of deaths were recorded for the same period—22 (16) and 2 (0) respectively. The counties with the greatest increases were: Derby 12 (8), Leicester 12 (8), London 47 (33), Staffordshire 33 (24), Warwickshire 35 (21). At the time of going to press reports have been received of an increasing spread, especially of influenzal pneumonia, in Durham and Birmingham districts.

Diphtheria and Scarlet Fever

There was a drop in the notifications of diphtheria in England and Wales during the week—1,166, compared with 1,209 in the previous week—and in London—125, compared with 129. In Scotland an increase was recorded: Glasgow 71 (70), Aberdeen 9 (6), Fife County 15 (3), Perth 5 (0). Of the 28 deaths in the 126 Great Towns of England and Wales 3 occurred in Birmingham, and 2 each in London, Bradford, Liverpool, South Shields, Wallasey, Stoke-on-Trent, Newport. Four deaths from diphtheria were recorded in Glasgow and 1 each in Ayr and Paisley.

Notifications of scarlet fever in England and Wales fell during the week under review—1,734, compared with 1,776 in the previous week; but in London there was an increase —180 (155)—and in Scotland, where 389 (380) cases were notified. The areas chiefly affected were: Aberdeen 13 (11), Ayr 7 (2), Fife 30 (22), Dunfermline 9 (4), Glasgow 97 (82), Paisley 14 (11). There were no deaths from scarlet fever recorded in the British Isles during the week.

Measles and Whooping-cough

There was only one death from measles (at Rhondda) in the 126 Great Towns of England and Wales during the week. The first notifications of measles and whooping-cough since these diseases were made notifiable in the administrative county of London are available for publication in this week's issue. As stated in these columns on October 8, page 770, all cases of measles and whooping-cough occurring in a household at an interval of two months from any previous cases must be notified to the borough medical officer of health. Of the 24 cases of measles notified the chief were in Southwark 5, Stepney 4, and Battersea and Wandsworth 3 each. In Scotland the notifications rose from 13 to 17 in the week under review, the centres affected being Glasgow 13 (6), and 1 each in Dunfermline (0), Lanark County (2), Greenock (1), and Paisley (1). Of the 8 deaths from whooping-cough in the 126 Great Towns 2 occurred in Walthamstow and 1 each in Hendon, Twickenham, Luton, Portsmouth, Leeds, Salford. In London 43 cases were notified, distributed mainly as follows: 5 each in Islington, Bethnal Green, and Lambeth, 4 each in Bermondsey and Stepney, and 3 each in Hackney, Southwark, Wandsworth, and Lewisham. In Scotland there was a decided increase in the notifications of whooping-cough during the week —109 (94)—chiefly in: Glasgow 84 (79), Paisley 12 (2), Edinburgh 6 (2). Two deaths were recorded, both in Glasgow.

Cholera: Plague

During the week under review there were 280 (237) cases of cholera and 135 (122) deaths in the United Provinces of India and 1,670 (3,463) cases and 743 (1,526) deaths in the Central Provinces. During the four weeks ended October 8 the incidence of cholera declined in most of the provinces, with the exception of those of the lower Ganges valley (Bihar and Bengal), and Assam. In the Central Provinces the number of cases declined during the four weeks ended September 10 from 30,948 to 15,048; in the same period the number fell in the United Provinces from 1,410 to 999, and in Bombay Presidency from 2,062 to 1,147. In Assam 1,102 cases were notified in the four-week period September 4 to October 1, compared with 522 during the previous four-week period. During the week ended October 8, 95 (113) cases and 33 (38) deaths were recorded in Shanghai, and in Hong Kong 9 (7) cases and 6 (5) deaths. From the reports of the two anti-epidemic units of the League of Nations in China, it appears that the cholera situation in the provinces of Central China is well in hand and the spread of the disease westwards has been checked.

In India during the week under review there were 46 (166) cases of plague reported in the Central Provinces and 4 (7) deaths, 37 (37) cases and 31 (27) deaths in Burma, 23 (35) cases and 12 (15) deaths in Madras Presidency, and 12 (21) cases and 8 (20) deaths in Bombay Presidency.

* Except where otherwise mentioned, figures in parentheses refer to the week preceding the one under review.

No. 40

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended October 8, 1938.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns (124 in 1937) in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1938					1937 (Corresponding Week)					1929-37 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	14	1	4		—	11	—	8		1		
Deaths		1	1				1	2				
Diphtheria	1,166	125	202	53	32	1,451	209	224	35	42	1,232	217
Deaths	28	2	6	3	—	25	3	6	—	—		
Dysentery	45	12	16		1	40	22	15		—		
Deaths				—	—				—	—		
Encephalitis lethargica, acute	5	—	2		—	3	—	—		—		
Deaths		—					3					
Enteric (typhoid and paratyphoid) fever	24	5	12	5	1	45	7	4	8	6	50	
Deaths	1	—	—	1	—	—	—	—	—	1		
Erysipelas			63	6	5			81	7	4		
Deaths		1					—					
Infective enteritis or diarrhoea under 2 years												
Deaths	57	7	13	16	3	68	21	21	7	4		
Measles		24	17		3			52		9		
Deaths	1	—	—	—	—	7	1	1	—	—		
Ophthalmia neonatorum	94	10	28		1	105	9	35		—		
Deaths												
Pneumonia, influenzal‡	453	47	5	1	12	679	45	6	1	4	638	52
Deaths (from Influenza)	22	2	—	1	—	32	10	6	—	1		
Pneumonia, primary			152	6				168	4			
Deaths		8		7	2		7		8	1		
Polio-encephalitis, acute	3	1				2	—					
Deaths												
Poliomyelitis, acute	65	6	8	1	1	39	5	3	—	—		
Deaths		1					1					
Puerperal fever	7*	7	13	1	1	3*	3	15	2	1		
Deaths		1†					1†					
Puerperal pyrexia	176	16	16		3	170	23	18		3		
Deaths												
Relapsing fever	—	—			—	—	—	—		—		
Deaths												
Scarlet fever	1,734	180	389	56	89	2,379	201	400	120	88	2,384	346
Deaths	—	—	—	—	—	3	1	2	—	—		
Small-pox	—	—	—		—	—	—	—		—		
Deaths	—	—		—	—	—	—		—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths				—	—				—	—		
Whooping-cough		43	109		6			24		5		
Deaths	8	—	2	1	—	4	1	—	—	1		
Deaths (0-1 year)	288	43	55	36	15	294	44	63	27	11		
Infant mortality rate (per 1,000 live births)	48	35				50	36					
Deaths (excluding stillbirths)	4,062	745	541	163	125	3,910	756	568	148	109		
Annual death rate (per 1,000 persons living)	10.0	9.5	11.0	11.0	11.1	9.7	9.5	11.6	10.1	9.7		
Live births	5,981	1,180	852	330	199	6,445	1,242	887	323	225		
Annual rate per 1,000 persons living	14.7	15.0	17.4	22.3	17.6	15.9	15.6	18.1	22.0	19.9		
Stillbirths	225	30				277	42					
Rate per 1,000 total births (including stillborn)	36	25				41	33					

* After October 1, 1937, puerperal fever was made notifiable only in the administrative county of London.

† Death from puerperal sepsis.

‡ Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

The Services

DEATHS IN THE SERVICES

Lieutenant-Colonel Ernest Edwin Waters, Bengal Medical Service (ret.), died at Camberley on September 20, aged 66. He was born on July 21, 1872, and was educated at St. Bartholomew's Hospital and at Edinburgh University, where he graduated M.B., C.M. in 1893, proceeded M.D. in 1903, and subsequently took the M.R.C.P.Lond. in 1911. He gained the Maclean Prize in Military Medicine at Netley, and entered the Indian Medical Service as surgeon lieutenant on July 29, 1895, became lieutenant-colonel on January 29, 1915, and retired on July 19, 1927. He served in the Tirah campaign on the North-West Frontier of India in 1897–8, where he took part in the actions on the Malakand and also those of Dargai, the Sampagha and Arhanga passes, and the Bazar Valley, receiving the frontier medal with two clasps. Most of his service was spent in Bengal in civil employ, which he entered in May, 1899, serving as superintendent of the Presidency General Hospital, Calcutta, as deputy sanitary commissioner, and as resident physician of the Medical College Hospital. Later in his service he held several of the most important medical appointments in Bengal, the civil surgeoncies of Cuttack, Murshidabad, and Howrah successively, and the post of surgeon-superintendent of the Presidency European General Hospital, Calcutta. He was the author of a work on *Diabetes, its Causation and Treatment, with Special Reference to the Tropics* (1927). He had been for many years a member of the British Medical Association, was a representative at the Annual Meetings, 1934–8, and chairman of the Guildford Division, 1935–7.

Lieutenant-Colonel John Gregory Jordan, Bengal Medical Service (ret.), died in London on October 5, aged 78. He was born on December 6, 1859, and was educated at Edinburgh University, where he graduated M.B., C.M. in 1883. He entered the Indian Medical Service as surgeon on September 30, 1886, became lieutenant-colonel after twenty years' service, and retired on April 18, 1918. He served on the North-West Frontier of India in the Mirarzai campaign of 1891, receiving the frontier medal with a clasp. Most of his service was passed in Bengal in civil employ, which he entered in 1892. On the partition of Bengal in 1911 he was elected for service in Bihar and Orissa. During the war he reverted to military duty in April, 1916, and remained on military duty in India until his retirement.

Medical News

The William Blair-Bell Memorial Lecture will be given by Mr. T. N. A. Jeffcoate, M.D., F.R.C.S.Ed., M.C.O.G., on "Uterine Inertia," at the British College of Obstetricians and Gynaecologists, 58, Queen Anne Street, W., on Friday, October 28, at 2.30 p.m. All medical practitioners are invited to attend.

Dr. G. Jessel will deliver his presidential address on "Serial Skiagraphy in Pulmonary Disease" before the North-Western Tuberculosis Society at the Tuberculosis Offices, 352, Oxford Road, Manchester, on Thursday, October 27, at 3.15 p.m.

At the Royal Society of Arts on Wednesday, November 2, at 8.30 p.m., Lord Amulree will give an address on "Industrial Holidays." Tickets may be had from the secretary of the society, John Street, Adelphi, W.C.2.

Viscount Samuel will give the fourth Clarke Hall Lecture, "Is the Criminal to be Blamed—or Society?" in the Hall of Gray's Inn on Thursday, October 27, at 4.30 p.m., with the Home Secretary, Sir Samuel Hoare, in the chair.

The Kensington Division of the British Medical Association has arranged a meeting, to which all members of the medical profession are invited, at B.M.A. House, Tavistock Square, W.C., on Wednesday, November 16, at 9 p.m., when addresses on "The Place of the Doctor in Air Raid Precautions" will be given by Wing Commander E. J. Hodsoll, Inspector-General of Air Raid Precautions, and Dr. Norman Hammer, Medical Adviser to the Home Office Air Raid Department.

Professor Henry Cohen will deliver his presidential address on "The Medical Knowledge of William Shakespeare" before the London Jewish Hospital Medical Society at the Anglo-Palestinian Club, 43, Great Windmill Street, W., on Sunday, October 23, at 8.30 p.m.

A special meeting of the Institution of Heating and Ventilating Engineers will be held at the Institution of Mechanical Engineers, Storey's Gate, Westminster, S.W., on Wednesday, November 2, at 7 p.m., when Mr. L. W. J. Henton will give an address on "Air-conditioning Requirements of Cinemas."

A meeting of the Association of Industrial Medical Officers will be held at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C., on Friday, October 28. At 5 p.m. there will be a business meeting, and at 6 p.m. Professor E. P. Cathcart will open a discussion on "The Feet of the Industrial Worker." Mr. C. Lambrinudi will show a film on "The Action of the Muscles of the Foot." Other speakers will include Mr. W. S. Creer, Dr. W. Blood, and Mr. Eric Gill. On Saturday, October 29, there will be a visit to Messrs. J. Lyons and Co., Ltd., Cadby Hall, W.

A meeting of the Medico-Legal Society will be held at 26, Portland Place, W., on Thursday, October 27, at 8.30 p.m., when a paper will be read by Sir Bernard Spilsbury on "The Medico-Legal Significance of Wounds."

A further wing of the Manor House Hospital, Golders Green, N.W., will be opened by Queen Mary on Monday, October 24, at 3 p.m. Invitations to the ceremony have been sent out by the president, chairman, and trustees of the Industrial Orthopaedic Society.

The 1938–9 programme of the West Kent Medico-Chirurgical Society is as follows: November 11, Dr. Macdonald Critchley, "Migraine." December 9, Purvis Oration by Sir Crisp English, "On Taking Stock." January 13, Clinical evening. February 10, Mr. Alistair L. Gunn, "Some Recent Advances in Midwifery." March 10, Mr. John G. Sandrey, "Genito-urinary Emergencies." April 14, Debate: "That Voluntary Euthanasia should be Legalized." Proposer, Dr. C. Killick Millard; seconder, Dr. Wm. A. MacIlrath; mover of negative, Dr. C. O. Hawthorne; seconder of negative, Mr. Stephen Power. May 12, President's address. Meetings are held at the Miller General Hospital, Greenwich, S.E., on Fridays at 8.45 p.m.

The North London Medical and Chirurgical Society has arranged the following programme for 1938–9: November 16, Medical clinical evening. December 14, Demonstration by Dr. Yeo and members of the staff of the *x*-ray department of the Royal Northern Hospital. January 18, Mr. W. B. Gabriel, "The Diagnosis and Treatment of Some Common Rectal Diseases." February 15, Surgical clinical evening. March 15, Mr. T. Anthony Green, "Treatment of Disease by Radiotherapy." April 19, Medical clinical evening. May 17, President's address and annual general meeting. All the meetings will be held at the Royal Northern Hospital, Holloway Road, N., on Wednesdays at 9 p.m.

The twenty-sixth French Congress of Medicine, which was to have been held at Marseilles on September 26, has been postponed until November 10 to 13. The following congresses which were to have been held this month have been indefinitely postponed: the twenty-fifth French Congress of Hygiene, the fourth annual Congress of French-speaking Electroradiologists, and the Franco-Yugoslav Medical Congress. The next congress of the Latin Medical Press, which was to have been held at Lisbon this year, has been postponed until the end of next summer.

L'Union Internationale contre le Cancer is arranging an "International Cancer Week" from November 23 to 30, which is to include an international conference to commemorate the discovery of radium, electrons, *x* rays, and Hertzian waves; papers will be read by experts of various nationalities. The opening meeting will take place at the Sorbonne on November 23, when the President of the French Republic and other distinguished people will be present. Further information can be obtained from the secretary-general, 18, Rue Soufflot, Paris Ve.

The August issue of the *Bulletin de l'Office International d'Hygiène Publique* contains articles on small-pox, post-vaccinial encephalitis in the Punjab, typhus in Poland, scarlet fever, diphtheria, dysentery in Calcutta, Canada, Great Britain, Bulgaria, and the United States, and dengue in Cairo.

The publishing firm of Theodor Steinkopff of Dresden and Leipzig have founded a journal for research into old age, *Zeitschrift für Altersforschung*, the first volume of which appeared in July this year.

At the recent International Congress of Obstetrics and Gynaecology held in Amsterdam, where the principal subjects for discussion were eclampsia, thrombosis and embolism, and hormones, it was decided that the next congress should take place in Rome in 1942.

Yorkshire film exhibitors at a recent meeting in Leeds decided to proceed with their proposal to provide an "iron lung" for the General Infirmary at Leeds for use by all the hospitals in Yorkshire. They also agreed to form a committee to raise the necessary funds, probably by promoting a Sunday concert at one of the large cinemas in the city.

Up to April 1 of this year 983 pilots and other members of the staff of the Pan-American air traffic for the United States, Mexico, and Guatemala have been inoculated against yellow fever. The vaccine is supplied by the Rockefeller Foundation.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors overseas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS should be addressed to the Advertisement Manager. Orders for copies of the *Journal* and communications with reference to subscriptions should be addressed to the Secretary, B.M.A. House, Tavistock Square, W.C.1.

The TELEPHONE NUMBER of the British Medical Association and the *British Medical Journal* is EUSTON 2111.

The TELEGRAPHIC ADDRESSES are
EDITOR OF THE *BRITISH MEDICAL JOURNAL*, *Aitiology Westcent, London.*
SECRETARY, *Medisecra Westcent, London.*

The address of the B.M.A. Scottish Office is 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh;* telephone 24361 Edinburgh), and of the Office of the Cumann Doctúirí na h-Éireann (I.M.A. and B.M.A.), 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin;* telephone 62550 Dublin).

QUERIES AND ANSWERS

Education in Switzerland

"AGRESTIS" will be grateful for information regarding schooling in Switzerland for two children, a boy of 12 and a girl of 13, whose father died three years ago of lung tuberculosis. Both react very strongly to the Mantoux test, and both have been treated on rest lines for symptoms which were considered to be due to the tuberculous infection. Both are now active and well, but the mother is anxious to take the children to Switzerland for two years. She proposes to live with them and to send them to school as day pupils. Schooling would have to be in one of the altitude zones, and ordinary schools (not schools for sickly children) are desired. They would probably have to go to separate schools.

Treatment of Psoriasis

"C. N." would be grateful for suggestions of any known remedy for psoriasis and for any new details of its pathology.

Origin of the Laryngoscope

R. S. S. writes: Your account (*Journal*, September 10, p. 604) of the origin of the laryngoscope, though accurate so far as it goes, does not go quite far enough. According to Morell Mackenzie (*Diseases of the Throat and Nose*, 1880, vol. i, p. 213) the first trace of the laryngoscope appears in 1743, when M. Levret, a distinguished French accoucheur, employed a speculum, which differed from the various *specula oris* then in use and consisted mainly of a plate of polished metal, for examining the throat. The laryngeal speculum of Bozzini (of Frankfort-on-Main) is well known, and is illustrated in Morell Mackenzie's first volume (p. 213); it was first shown about 1804, and his publication on the subject appeared in 1807. Babington's (1829) and Liston's (1840) laryngoscopes were mentioned by you, but Avery's (1844), which resembled Bozzini's, was much more useful. It is true, however, that the use of the modern laryngoscope dates from Manuel Garcia (1855), Türck (summer, 1857), and Czermak (November, 1857). The first book in English on the use of the laryngoscope was written by James Yearsley, founder of the Metropolitan Ear, Nose, and Throat Hospital (*Introduction to the Art of Laryngoscopy*, London, 1862). Morell Mackenzie's book, *The Use of the Laryngoscope*, was published in London in 1865. Mackenzie, "the father of English laryngology," was assistant physician to the London Hospital, and became acquainted with laryngoscopy when he visited the clinic of Professor Czermak at Pesth in 1859. Türck of Vienna had read Garcia's paper, and tried unsuccessfully to employ the laryngeal mirror in the General Hospital of Vienna. Czermak borrowed the mirrors which Türck had laid aside, and, "being possessed of a most capacious pharynx, small tonsils and uvula, and a large laryngeal aperture," his investigations on his own larynx proved most successful. Türck afterwards claimed priority, but the general employment of the laryngoscope in medicine must be attributed to the enthusiastic teaching and brilliant demonstrations of Czermak.

Treatment of Pruritus Ani

Dr. SYLVIA ASHTON (London, E.18) writes in reply to "J. M." (October 1, p. 728): I have a patient who had pruritus ani, of no known cause, which cleared completely in two or three days after the application of calomel (hydrarg. subchlor.) used as a dusting powder and applied night and morning. Various cocaine ointments had had no effect.

Dr. CHARLES NYHAN (Co. Cork) also writes: "J. M." should first look carefully for any local lesion—fissure, haemorrhoids, worms, inflammatory conditions of the rectum or colon, effects of previous dysentery, etc.—each or any of which must receive its own specific treatment. A tablespoonful or more of sodium sulphate dissolved in a little over a wineglassful of boiling water should be taken warm first thing each morning. After evacuation an enema of strong saline solution (1 to 1½ pints) should be given. After this has been passed an iodoform suppository should be inserted deeply into the anal canal. Another enema should be given at bedtime, followed again by the insertion of a suppository. Relief of symptoms should be noted after two days, but the treatment should be continued for ten days and repeated if the symptoms return. I would be glad to hear from "J. M." the result of this treatment.

"R. A." also writes: I suffered from pruritus ani for nearly fifty years. I got into the habit of washing with soap and water after every evacuation. This gave considerable relief, but what gave me most relief during an attack—usually at night—was swabbing with surgical spirit. Three years ago I had my appendix removed, and since then I have had no recurrence of the pruritus. The only attack of appendicitis I had had previously was fifty-eight years before.

Income Tax

Proportion of Expenses

"XXX" is a partner in a large seaside town. He was unable to acquire his predecessor's residence, and in his present house has to give up both his sitting-rooms at surgery hours and other times. The inspector of taxes has written saying that he considers one-third of the whole expenses to be a reasonable proportion to set against the practice. "XXX" says he understands that two-thirds has generally been allowed.

*** In our experience two-thirds is allowed only in exceptional circumstances; normally it does not leave enough to

cover private use. For example, one-third of £150 rent would usually be less than the private part of such a house would cost to rent. But in the circumstances mentioned a one-third allowance seems clearly inadequate, and we advise our correspondent to claim one-half, and carry his point to personal appeal to the local or Special Commissioners if necessary. Judging from the inspector's letter he seems to have overlooked two material points: first, that the ground floor is in terms of rent worth more than the others, and, second, that the garage is almost entirely "professional."

The Cash Basis

"W. H." has hitherto been assessed on the cash basis, but "a new inspector" says this method is wrong, and is asking for information as to the amount of debts outstanding at April, 1937 and 1938, and for an estimate of bad debts so as to recalculate the profits on the earnings basis. Is this usual?

*** It has to be admitted that in strict law the "bookings" basis is correct; the cash basis is obviously more convenient, and for that reason is accepted by the Revenue authorities where the circumstances do not make it unfair. For example, it would not work equitably in the case of an increasing practice or in the early years of a new one, because the whole of the expenses are being charged but some of the earnings therefrom are not being credited. If the gross bookings of our correspondent's practice are steady we think the inspector should—and will on reconsideration—withdraw his request for the specified particulars, which he evidently proposes to use to adjust the "cash" figures to a "bookings" basis.

Motor Car Expenses

"C. M. O." holds some appointments which necessitate a good deal of travelling. He has kept accurate records for some years and finds that they are "fairly uniform." He has therefore suggested to the inspector of taxes that he need not continue to keep the records for the future, but he declines to agree.

*** It is probably difficult for the inspector to agree, seeing that such records are officially desirable, and it may be that if "C. M. O." discontinued the records and next year made a definite statement that he was sure that his official mileage was not less than in the previous year, the inspector might then accept the statement. But unless the records are really troublesome we should advise our correspondent to go on with them.

Increase in Partnership Share

"S. D." bought a one-third share in a partnership in January, 1935, and increased it to a half share in April, 1937. The firm's accounts are made up to December 31. He has paid both instalments of tax for 1937–8 on the one-third basis but is now told that he will have to make an additional payment to bring the tax up to one-half basis. Is that correct?

*** Yes. The "previous year basis" applies to the calculation of the firm's profits, so that if £x was the amount of the firm's earnings for the year to December 31, 1936, then £x is taken as the firm's income, for income tax assessment purposes, for the year to April, 1938. That assessment has to be divided between the partners in the ratio in which the profits are shared *for the year of assessment*, and therefore "S. D." will have to account for tax on half the assessment. ("S. D." refers to payment on the receipts of 1937, but there seems no reason why the 1936 basis of calculation of the firm's assessment should be set aside for the 1937 profits.)

Deduction for Assistant's House

"M. H." has an assistant who lives at the branch surgery and pays 30s. a week rent. The house and surgery were originally semi-detached houses and were bought and adapted by "M. H." What should he deduct as an expense in this connexion?

*** He has two alternatives: (*a*) to exclude the 30s. rent from his professional receipts and to deduct only the expenses relating to the surgery, or (*b*) to include the rent and deduct the expenses incurred on the whole premises. The latter is frequently more convenient. The expenses deductible cannot be based on the capital cost of the premises or on what they previously produced in rent, but on the facts as they exist now. They would include rates, repairs, and the amount of the net Schedule A assessment on the property.

LETTERS, NOTES, ETC.

Stolen Instruments

"M.D., F.C.O.G." writes: It is with some alarm that I hear of widespread thefts of surgical instruments from doctors' and consultants' cars, and quite recently I had a complete set of gynaecological instruments stolen from my car. If these stolen instruments had no market they would obviously be dumped somewhere by the thieves and in many cases would be recovered by the police, but in several cases I know of neither the thieves nor the instruments have been discovered. It seems not impossible that widespread dealing may be going on in stolen surgical instruments.

John Shaw Billings

Dr. Mazyck P. Ravenel writes from the University of Missouri: In your issue of August 27, 1938, p. 458, you give a review of the April number of the *Bulletin of the Johns Hopkins Hospital* which contains a series of papers on John Shaw Billings. The statement that he volunteered for medical service with the Confederate Army is not correct. He was attached to the Army of the Potomac under General Hooker. Dr. Billings was a Northerner, and had no sympathy with Secession so far as the evidence goes, though he was very friendly to many Southerners after the war was over.

A Collection of Journals

Dr. Claud F. Druitt (Springfield, The Avenue, Walton-by-Clevedon) has a complete collection of the *British Medical Journal* for the past thirty years, which he thinks might form the nucleus for a newly started medical library, and is willing to present them to anyone interested if packing and transit expenses were found. The volumes are carefully sewn together, with the indexes at the beginning of each, the whole being finished with a brown-paper cover and date label. Dr. Druitt has the volumes arranged on open shelving, which is built in sections and could easily be removed with the volumes. A photograph of the volumes on the shelving can be seen on application to the Librarian of the British Medical Association. Dr. Druitt also has a complete collection of the *Practitioner* since 1918. These are unbound, but arranged in order, and would be sent on the same terms to any medical library, or will be disposed of privately if desired.

Percaine Handbook

Percaine was first introduced by Ciba Limited (48, Southwark Street, S.E.1) in 1929; since that time some 2,000 papers have been published recording the results of clinical and pharmacological investigations of its properties. *The Percaine Handbook* is a review based on eighty-nine of these articles, to which detailed references are given. A brief account of the chemical, physical, and pharmacological characters of percaine is followed by a comprehensive survey of its clinical applications. Of particular interest is a detailed comparison of the techniques of spinal anaesthesia elaborated by Howard Jones, Etherington Wilson, Sebrechts, and other workers. The booklet will be sent on request to any medical practitioner.

Disclaimer

Mr. Ivor Lewis writes: My attention has been drawn to sensational and inaccurate reports in the lay press of an operation recently performed at the North Middlesex Hospital. I need hardly say that these appeared without my consent or knowledge. The survival of a patient after a Trendelenburg operation for pulmonary embolism doubtless has the makings of a "good story," but one feels that the newshawks might at least allow it to be dealt with in the professional press in the first place!

Correction

In Fig. 5 illustrating Mr. Lake's article on "Infections of the Hand and Fingers" in the *Journal* of October 1, p. 717, there was a mistake in the legend. After (*f*) should have appeared "flexor longus pollicis" and not "extensor longus pollicis."